MAY 4 - 1932

Journal of the Association of American Medical Colleges

Volume 7 MAY, 1932 *Number 3*

CONTENTS

PAGE

Report of the Committee on Aptitude Tests for Medical Students. *F. A. Moss* - - - - - - - - - - 129

Premedical Qualifications in Relation to Achievement in Medical School. *Walter H. Moursund* - - - - - 149

Teaching of Surgery. *Fred C. Zapffe* - - - - - - 158

Dentistry: The Errant Branch. Shall Medicine Re-adopt It? (concluded) *F. T. Van Beuren, Jr.* - - - - - 167

Editorials - - - - - - - - - - - - - - - 175

News Items—College - - - - - - - - - - - - - 177

" " —Personals - - - - - - - - - - - 183

" " —General - - - - - - - - - - - 185

Abstracts - - - - - - - - - - - - - - - 187

New Books - - - - - - - - - - - - - - - 191

Published bimonthly, January, March, May, July, September and November, at 5 South Wabash Ave., Chicago, Illinois, by the Association of American Medical Colleges. Subscription Price, $3.00 per year. Single Copies, 75 cents.

Entered as second class matter January 17, 1930, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

(Continuing the Bulletin of the Association of American Medical Colleges)

CONSIDERING TESTS?

THEN SEE

SAUNDERS' ANNOUNCEMENT—Just Inside

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

OFFICERS AND COMMITTEES FOR 1931-1932

President: Louis B. Wilson, Rochester, Minn.
Vice-President: H. G. Weiskotten, Syracuse, N. Y.
Secretary-Treasurer: Fred C. Zapffe, 5 South Wabash Ave., Chicago.

Executive Council

Alexander S. Begg, Chairman, Boston; G. Canby Robinson, New York City; Louis B. Wilson, Rochester, Minn.; Maurice H. Rees, Denver; C. C. Bass, New Orleans; B. D. Myers, Bloomington, Ind.; Fred C. Zapffe, Chicago.

MEMBERS

Alabama

University of Alabama, School of Medicine, University.

California

College of Medical Evangelists, Loma Linda and Los Angeles.

Sanford University School of Medicine, San Francisco and Stanford University.

University of California Medical School, San Francisco and Berkeley.

Canada

McGill University Faculty of Medicine, Montreal.

University of Manitoba Faculty of Medicine, Winnipeg.

University of Toronto Faculty of Medicine, Toronto.

Colorado

University of Colorado School of Medicine, Denver.

Connecticut

Yale University School of Medicine, New Haven.

District of Columbia

Georgetown University School of Medicine, Washington.

George Washington University Medical School, Washington.

Howard University School of Medicine, Washington.

Army Medical School, Washington (Honorary).

Navy Medical School, Washington (Honorary).

Georgia

Emory University School of Medicine, Atlanta.

University of Georgia Medical Department, Augusta.

Illinois

Loyola University School of Medicine, Chicago.

Northwestern University Medical School, Chicago.

University of Chicago (Rush), Chicago.

University of Illinois College of Medicine, Chicago.

Indiana

Indiana University School of Medicine, Bloomington and Indianapolis.

Iowa

State University of Iowa College of Medicine, Iowa City.

Kansas

University of Kansas School of Medicine, Lawrence and Rosedale.

Kentucky

University of Louisville School of Medicine, Louisville.

Louisiana

Tulane University of Louisiana School of Medicine, New Orleans.

Maryland

Johns Hopkins University School of Medicine, Baltimore.

University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore.

Massachusetts

Boston University School of Medicine, Boston.

Medical School of Harvard University, Boston.

Tufts College Medical School, Boston.

Michigan

Detroit College of Medicine and Surgery, Detroit.

University of Michigan Medical School, Ann Arbor.

Continued on Third Cover Page

JOURNAL
OF THE
Association of American Medical Colleges

Volume 7 MAY, 1932 Number 3

Report of the Committee on Aptitude Tests For Medical Students*

F. A. Moss
George Washington University

Following the report of our committee at the last annual meeting of this Association, resolutions were adopted by the Association providing:

"That the Association recommend the use of Aptitude Tests as one additional criterion for selecting medical students.

"That the next year the tests be given the same day in all the premedical schools in the United States, and a distribution showing the standing of all the applicants together with the names and scores of the individuals applying to each school be sent to the dean of the medical school concerned."

I. The Administration of the Medical Aptitude Tests in the Premedical Schools, in February, 1931.

A large part of the work of the Committee on Aptitude Tests[1] the past year has consisted in carrying out these resolutions. Immediately following the Denver meeting, steps were taken to organize the work for giving the aptitude test to all students who were applying for entrance to medical schools this fall.

In order that no applicant should have an unfair advantage over others because of having seen one of the previous forms, it was necessary, first, to construct an entirely new form of the test for use in this year's testing. The various items of the two experimental forms of the test were studied in detail with a view to determining which items gave the best indication of success in the medical school. New items were constructed along these same lines and were tried out with a group of known ability. The final test as used consists of six parts: (1) Scientific vocabulary; (2) visual memory for anatomical drawings; (3) memory for descriptive material; (4) premedical information; (5) learning and retention of material, and (6) understanding of difficult printed material. The total working time required for taking the test was one hour and a half.

*Read before the Forty-second Annual Meeting of the Association of American Medical Colleges, held in New Orleans, Nov. 30, Dec. 1 and 2, 1931.

1. The Committee: Torald Sollmann, Chairman; H. G. Weiskotten; Edward Koch; Beverly Douglas and F. A. Moss, Secretary.

COOPERATION.—Excellent cooperation in carrying out the testing has been given by both medical and premedical schools. All the medical schools cooperated in the preparation of a list of schools and colleges training premedical students; and many of the medical schools aided directly in securing cooperation in the premedical schools from which their applicants came.

The premedical schools cooperated in the administration of the test to their applicants, and in forwarding the papers to the committee for scoring. The total number of premedical schools in which the tests were given in February was 547. In this number are included premedical schools from every state of the United States. Premedical schools in Canada, the Philippine Islands, Porto Rico and Hawaii were also represented. Only two important American premedical schools failed to cooperate last year, and both of these have agreed to cooperate this year. In addition, correspondence with a number of premedical schools that had no students applying for admission this year, indicated their interest and willingness to cooperate in years when they have applicants to the medical schools. In the schools the tests were given by a designated member of the staff, usually a member of the teaching staff of a department in close touch with the premedical work of the college.

Many helpful suggestions for carrying on and improving the work have been received from both the medical schools and the premedical schools. The committee appreciates greatly the help that it has received, not only by immediate cooperation, but also by constructive criticism and suggestion; for it seeks to receive as well as to give information.

GIVING AND SCORING OF TESTS.—The tests were given February 13 at the same hour in all the schools throughout the country. After being given, all the tests were forwarded to the office of the committee for scoring and tabulation. As soon as the tests arrived, a corps of examiners and statisticians began scoring the tests and tabulating the results. The first report was sent to the deans or admission officers of the medical schools, March fifteenth.

MAKING RESULTS AVAILABLE.—Results on the tests were supplied to the medical schools in two ways:

First, a list of all the students taking the test was sent to each medical school. This list gave for each student his total score on the test, and his percentile rating, or relative standing in the whole group tested. This list was arranged by states and by premedical schools within the states.

Second, a more detailed record was sent to each medical school for

those students who had indicated that they are applying or would apply for admission to a particular medical school. This record gave for each student a detailed analysis of his test, giving separate scores on the six parts of the test.

All the premedical schools cooperating have received a report on their own students, giving each student's total score and percentile rating. No results have been returned to the applicants themselves, and the premedical schools have been asked to regard the reports as "strictly confidential information."

SUMMARY OF RESULTS.—A total of 9,220 students applying for admission to the medical schools took the test. The test scores for these students ranged from 15 to 240. This indicates the great inequality of applicants, some making within fifteen points of zero, and others within ten points of perfect. The highest made sixteen times as much as the lowest. The total distribution is shown in Table 1. The median score of the group is 134, the upper half making scores of 134 or above, the lower half below 134. The upper quartile point is 164, the highest fourth making 164 or above. The lower quartile point is 105, the lowest fourth falling below this score.

The results are reported in percentile ratings as well as in terms

TABLE 1. DISTRIBUTION OF NUMBER TAKING TEST BY STATES

State	Number	State	Number
Alabama	168	Nebraska	184
Arizona	8	Nevada	10
Arkansas	63	New Hampshire	100
California	390	New Jersey	58
Colorado	61	New Mexico	17
Connecticut	105	New York	1450
Delaware	5	North Carolina	225
District of Columbia	245	North Dakota	33
Florida	48	Ohio	658
Georgia	133	Oklahoma	111
Idaho	11	Oregon	100
Illinois	400	Pennsylvania	1097
Indiana	265	Rhode Island	47
Iowa	219	South Carolina	73
Kansas	135	South Dakota	42
Kentucky	143	Tennessee	118
Louisiana	150	Texas	339
Maine	26	Utah	65
Maryland	125	Vermont	43
Massachusetts	301	Virginia	225
Michigan	308	Washington	90
Minnesota	185	West Virginia	154
Mississippi	52	Wisconsin	132
Missouri	247	Wyoming	6
Montana	27	Foreign	23

of total score. The percentile rating indicates where the student falls in relation to the whole group taking the test. For example, if a student's score is 104, his percentile rating is 24. This means that he falls 24 per cent of the way to the top of the group; he makes as high as or higher than 24 per cent of those taking the test, and 76 per cent are above him. Or, if a student has a score of 204, his percentile rating is 96. He makes a rating as high as or higher than 96 per cent of those taking the test, only 4 per cent are above him. The complete table from which percentile ratings were taken was given in a previous report.[2]

The exact use made of the test results and the exact standards to be required on the test vary according to the local conditions in the medical schools. Many of the medical schools gave equal weight to three criteria in admitting the students, as follows: (1) Aptitude test rating; (2) scholarship, as indicated by grades in premedical work, and (3) personal interview ratings, letters of recommendation and other indications of personal fitness.

II. The Test to be Administered December 11, 1931.

Within a little over a week from the time this report is given, the fourth form of the medical aptitude test will be administered in the premedical schools and colleges to the students who will apply for entrance to the medical schools next fall. There are a few changes in the procedure and in the test in which members of the Association will be interested.

First, the time for giving the test has been moved forward about two months. This has been done after consideration of the requests of the deans and admissions committees of many of the medical schools, that results of the tests be made available by February 15th. Last year, allowing a month for completing the scoring and tabulation of the tests, no results were available before March 15. This year it is planned to have the results available by the beginning of the second semester, more than a month earlier than last year. This will be of distinct advantage to those schools that make their selection of students early.

Advancing the date for giving the test has necessitated making certain changes in the premedical information part of the test. In the previous forms of the test, from 90 to 100 points out of 250 have been based on premedical training in biology, general chemistry, organic chemistry and physics. With the earlier administration of the test, it is quite obvious that two-year students, most of whom will have finished less than half a year's work in some of these required sciences, would

2. J. Assoc. Amer. M. Colleges, 6:304 (Sept.), 1931.

be at a distinct disadvantage as compared with three or four-year students who will have already completed these requirements. Since previous study of the value of various parts of the test in predicting success has indicated that command of information is a valuable criterion, it seems desirable to retain the premedical information test. In order not to penalize the student who may have good ability but has not completed the minimum requirements in these four subjects, a special method of scoring is being followed in rating this test. A record of the courses completed in chemistry, biology, and physics by each student is obtained from the registrar of his school. The student is then rated on the premedical information part of the examination only on the basis of those subjects that he has completed. For example, if he has completed only zoology and general chemistry (60 points of the total 100), but has not finished courses in physics and organic chemistry (40 points of the 100), his score on the 100 points of this test is determined by multiplying his record in zoology and general chemistry by 5/3 or 1⅔.

Other changes in the test include the addition of a new test for measuring ability to understand and follow directions. Also, the total length of the test is slightly longer (with a slightly longer time limit) than last year.

A carefully organized report on all the students taking the test will be sent to the admissions officers of each medical school. It will be prepared in the form of a book, not only giving a complete distribution of grades and other general data about the test results, but also giving a detailed report on each applicant, showing his total score and percentile rating on the test. It will be in much more convenient form than last year's report.

III. Value of the Aptitude Test in Predicting Three Years of Medical School Grades.

The study of the predictive value of the test in relation to grades in the medical school courses has been continued over the past school year. Students in fourteen medical schools (approximately one thousand students) who took the test in the school year 1928-1929 furnished data for study of the predictive value of the test over three years of medical school work.

Figure 1 shows how well the test predicted the success of these students over three years of work. The students were divided into ten equal groups on the basis of their scores on the aptitude test. Each bar shows the percentage of failures occurring in the three years and the average grade of the group. It is of interest to note that in the highest tenth no man has failed in any of the three years, and the group shows

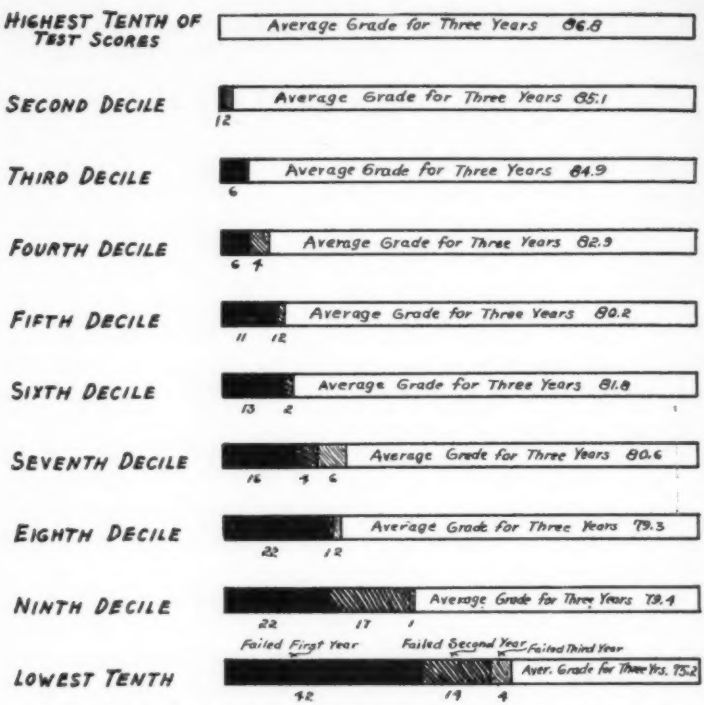


Fig. 1. Distribution of Three-Year Medical School Averages According to Tenths of Test Scores.

an average grade for the three years of almost 87. Ten per cent of this group have three-year averages of 90 or higher. On the other hand, by the end of the third year, 60 out of a hundred have failed in the lowest tenth, while the three-year average for this tenth is only 75.2, just barely passing. None show an average as high as 90 and only one per cent even as high as 85.

As might be expected, the chart shows fewer failures in the later years of medical school. The largest number of failures occurs the first year, fewer the second year, and still fewer the third year. Another thing that is noticeable in comparing this chart with the similar one for these students last year when they had completed only two years of medical school work, is that the average grades for the various groups are slightly higher. This is due to the fact that there is a tendency to give somewhat higher grades in the third year subjects than in first and second year subjects.

Based on the distribution of three years of medical school grades in the various test groups, the chances of varying degrees of success may be stated as follows:

If a student has a score as high as the upper tenth of those tested: the chances are 100 per cent that he will pass successfully the three years work; and the chances are 79 out of 100 that he will average 85 or over for the three years. On the other hand, if he is as low as the lowest tenth tested: the chances are 60 out of 100 that he will fail by the end of the third year; and the chances are 99 out of 100 that he will average below 85 for the three years work; or 66 out of 100 that he will average below 80.

Since the application of tests will be made separately in each school, and since many will be more interested in the results of individual schools, we are presenting a separate analysis in a typical school in our three year group.

In School 1 (University of Cincinnati) there were 72 students taking the test as freshmen in the school year 1928-1929. Their aptitude test scores ranged from 109 to 226. We present the records of the lowest ten on the test as compared with the highest ten.

The records of the lowest ten are as follows:

Student A. Failed one subject the first year. Dropped on account of poor scholarship the second year.

Student B. Average grade of 77 the first year. Failed two subjects the second year; only one subject above 80. Dropped on account of poor scholarship second year.

Student C. First year average 75. Dropped for poor scholarship second year.

Student D. Failed in one subject and conditioned in two subjects first year. Dropped at end of first year.

Student E. Two subjects below 80 the first year. Conditioned in three subjects the second year. Average of 77. Conditioned in one subject and below 80 in two more the third year. Still in school but with a very poor record.

Student F. Conditioned in one subject and all subjects below 80 first year. Withdrew middle of second year.

Student G. Failed one subject and conditioned in one subject first year. Average 78. Withdrew beginning of sophomore year.

Student H. Failed three subjects first year, and dropped for poor scholarship.

Student I. Failed one subject first year. Conditioned in one subject second year. Average 79.5. Third year satisfactory.

Student J. Average first year, 77. Dropped second year for poor scholarship.

In this group of the ten lowest, only two are still in school, and both these have poor records, one of them having no year with a clear record of all passing grades. Had a test criterion been used in admitting this class, and a critical line drawn high enough to include these lowest ten, no good students would have been eliminated, but a very large percentage of the failures that have occurred in the three years in this school would have been eliminated.

Now, let us compare the highest ten on the test in this same class. Their records are as follows:

Student P. Average first year, 83; second year, 84; third year, 88; average for three years, 85.

Student Q. Average first year, 86; second year, 80; third year, 89; average for three years, 85.

Student R. This student had two condition grades the first year and one the third year, although some of his grades have been very good. Records from the dean's office have characterized this student as "careless" and "sloppy."

Student S. Average first year, 87; second year, 82; third year, 90. Average for three years, 86.

Student T. Average first year, 80; second year, 80; third year, 86. Average for three years, 82.

Student U. Average first year, 87; second year, 85; third year, 89. Average for three years, 87.

Student V. Average first year, 90; second year, 91; third year, 90. Average for three years, 90.

Student W. Average first year, 94; second year, 90; third year, 92. Average for three years, 92.

Student X. Average first year, 90; second year, 86; third year, 90. Average for three years, 89.

Student Y. Average first year, 88; second year, 85; third year, 91. Average for three years, 88.

Student Z. Average first year, 81; two conditions second year; one third year. Second year grades poor. Most of grades first year and third year good.

Most of the students of this group have very high grades. Only three have an average for the three years below 85. All are still in school, and the chances are very great that all will graduate from the medical school, although two have records considerably below what might have been predicted from the aptitude scores. Exceptions, such

as these, are usually found in the cases of students who have bad habits of work, and interfering factors of an extraneous nature. The test places them in ability, but it cannot predict these interfering factors. The comparison between this group and the group of lowest ten is very striking. All of these are still in school, most of them with records among the highest in the class. In the low group only two are in school, both of these with very poor records.

IV. Further Study of the Aptitude Test in Predicting Grades for 5,000 Students Who Took the Test as Freshmen Two Years Ago.

This part of the study consisted in the analysis of grades for approximately 5,000 students in 64 schools who took the test as freshmen during the school year 1929-1930. The relation between grades (two year average) and test scores for the group is shown in Figure 2. The students were divided into ten equal groups on the basis of their scores on

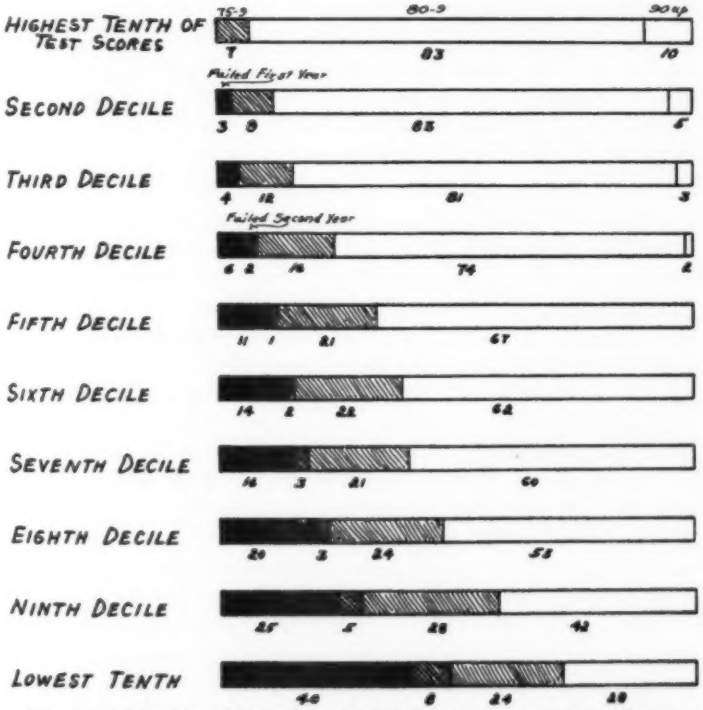


Fig. 2. Distribution of Two-Year Medical School Averages According to Tenths of Test Scores.

the scholastic aptitude test. Each bar shows the medical school grades over two years for one-tenth of the group. For example, in the highest tenth of test scores, there are no failures in either the freshman or sophomore year, and ten per cent have a two-year average of 90 or higher. Contrast this with the lowest tenth. We find 40 per cent failing the freshman year, and 8 per cent more failing the sophomore year. None have averages as high as 90, and 72 per cent have averages below 80. The other lower groups show a large percentage of failures and low grades, while the other higher groups show most of the average grades above 80.

It seems that the chances are almost certainty that a student in the highest tenth will pass at the end of two years work, and about 93 out of 100 that he will average above 80. On the other hand, the student in the lowest tenth has only about a fifty-fifty chance of passing at the end of two years; and only about one chance in four of obtaining a two year average as high as 80.

These results on the two year group agree substantially with those for the two year group in a smaller number of schools reported last year. The results corroborate our previous findings, in this instance on a group including most of the medical schools of the United States and with a second form of the aptitude test.

V. Studies of Premedical Grades.

Since premedical grades or scholarship in premedical studies is a universally employed criterion for admission to medical schools, our committee has been interested in further study of predictive value of these as related to and as used with test results.

This year we obtained premedical records for all the students in the medical schools who took the test three years ago and for whom we have a three-year record in the medical schools. For these, total test scores predict 60 per cent of the failures over the three years. Premedical averages, demanding an "80" or "C" criterion and including all the premedical requirements, predict 48 per cent of the failures. A combined criterion of premedical grades and test score gives a higher prediction of failures than either alone.

Our committee is now about to undertake a detailed study of separate premedical subjects and of separate parts of the aptitude test. Attention to the value of each separate factor in prediction of medical school success should perhaps enable us to improve the test and to arrive at improved requirements in premedical subjects. We have found an average prediction of 53 per cent of failures by separate parts of the aptitude test and an average prediction of 38 per cent of failures by

separate premedical subjects. Our study has not yet been thorough enough to warrant comparisons between different premedical subjects.

Some very interesting things which emphasize certain values of the test have come to light in our present study of premedical grades and test scores. These are considerations especially applicable to those medical schools that receive students from many premedical colleges. An examination of the following tables will make the value clear (Tables 2 to 5).

In Medical School I (University of Tennessee), for example, we found that there were 17 failures out of 98 students at the end of three years' medical school work. This medical school is part of a large university whose undergraduate department trains premedical students.

TABLE 2. MEDICAL SCHOOL I: 98 students; 17 failures at end of three years' work.

	Average Test Score	Average premedical grade	Percentage of failures	Number of students
Students from School "A" (Own University)	144.3	81.2	9%	34
Students from School "B"	157.5	83.5	10%	19
Students from Other Schools	123.4	81.6	27%	45

A portion of the students of the medical school, in this instance 34 of the 98, were drawn from its own undergraduate premedical department. Nineteen of the remaining students of this medical class are drawn from another premedical school which we have designated as School "B." The remaining 45 are drawn from scattered premedical schools. Now, in examining the source of the 17 failures we find a very interesting situation. Only 9 per cent of those from School "A" (the home premedical department) failed; 10 per cent of those from School "B" failed; while 27 per cent of those drawn from the other schools failed.

We examined the premedical grades of the students from the different premedical groups. The average premedical grades for the three groups are quite comparable, and indeed the group showing 27 per cent of the failures has a slightly higher premedical average than those from School "A." It might also be stated that the majority of the 27 per cent of failures as individual cases had creditable premedical college records. Yet we know that these three groups must differ in calibre in some way; or there is nothing to account for the difference in medical school performance.

An examination of the test score averages will, perhaps, suggest an answer to the problem. We note in this respect the wide difference between 123 and 144 or 157 as test averages for the groups. Average ability of those drawn from the third group is markedly below that of

those from Schools "A" and "B", yet the premedical averages do not reveal it.

An examination of similar records in Medical School II (Boston University) are even more convincing. Note particularly those students from Premedical school "D"—with an average of 86 in medical school, a very creditable group indeed. In looking for the explanation of their superior work, we notice their premedical records—an average of 82—no higher than for those from any other premedical school. But we find their test average is 190 as compared with 157, 160 and 165, respectively, for the other groups.

TABLE 3. MEDICAL SCHOOL II: 56 students; 5 failures at end of three years' work.

	Average Test Score	Average premedical grade	Average medical school grade	Number of failures
Students from School "C"	157.5	84.3	83.5	1
Students from School "D"	190.0	82.0	86.0	1
Students from School "E"	165.0	83.2	82.5	1
Students from Other Schools	160.0	82.0	82.6	2

One more similar illustration is given in Medical School III (Baylor University). Others might be added. All the medical schools studied showed similar results except those where practically all their students were drawn from the same premedical school, or schools of very similar qualifications and standing.

TABLE 4. MEDICAL SCHOOL III: 76 students; 27 failures at end of three years' work.

	Average Test Score	Average pre-medical grade	Average medical school grade	Percentage of failures
Students from School "F"	115.0	80.5	78.0	45%
Students from School "G"	125.0	79.8	80.5	16%
Students from Other Schools	121.3	80.9	79.0	40%

The conclusion to which we are led in examining such results is that premedical grades do not satisfactorily differentiate students if drawn from widely differing premedical schools. There are not comparable standards of grading premedical work; an 82 in one premedical college cannot be considered as representing the same as an 82 in another, either in ability of student or necessarily in scholastic qualification. But if test scores, based upon the same tests given under the same conditions, at the same time in all the premedical colleges, be examined, the same students can be fairly well judged in ability on a comparable basis.

The same sort of thing is shown by comparing the correlations between medical school work and premedical grades in those medical

schools which draw practically all their students from the same premedical college as compared with the medical school that draws its students from widely different premedical colleges. In the first type the correlation of medical school work with premedical grades is nearly always higher than in the second type. We found one or two instances where the correlation of medical school work with premedical grades was higher than with test scores, though this was a rare finding. School IV (Stanford University) shown in the table is an example. The correlation between the premedical averages and the medical school work is 0.68; that between the medical school average and test score is 0.62.

TABLE 5. MEDICAL SCHOOL IV:
Most of the students prepared in premedical school of own University

Correlation between *Premedical grades* and Medical grades	.68
Correlation between *Aptitude Test scores* and Medical grades	.62
Correlation between *combination* of premedical grades and test scores, and medical grades	.81

The significant fact here is not that the premedical grades give a slightly higher correlation, but that both are so good. The correlation obtained by combining premedical grades and test scores is 0.81, giving an exceedingly high predictive value for the combined criterion. This is the best criterion and our committee has always advocated the use of such a combined criterion, rather than either alone.

On the other hand, the situation that prevails in most medical schools is that of students drawn from a variety of premedical colleges. In all these we have found the correlation between medical school work and premedical grades lower than between medical school work and test scores. In such instances test scores are a better criterion of success in medical school than are premedical grades, in many instances a very much better criterion. However, in these schools also a combined criterion usually yields best prediction of success in the medical school.

Discussion

DR. R. V. PATTERSON (Jefferson Medical College) Philadelphia: Our situation at Jefferson Medical College is somewhat different from that of most of you in that we have no preparatory department and, therefore, no commitments as regards to the admission of students from our own college. While we operate under a university charter, so far only the medical school has been organized under that charter.

A second factor that enters into our experience is the fact that our students are very widely distributed geographically and institutionally, more so, I believe than in any other medical school. In our student body approximately 125 different universities and colleges are represented, and they come from nearly every state and from some foreign countries.

I have had made a brief and rather simple statistical study of our experi-

ence with the aptitude test. This analysis concerns only the first and second years' work of the class of 1933, and deals with 155 students.

The highest score possible in the aptitude test is 250, and the highest score made by any student from any school was 240. The highest score made by any one of the students in the group studied was 221. The median of our group of 155 students is 150 and a fraction. I have arbitrarily divided the group, based on that figure, into four groups: the first quarter, those who rated above 175; the second quarter, those from 150 median to 175; the third group, from 129 to 150; and the lowest quarter, those who rated below 129.

Taking those groups, 52 per cent of the failures in the first two years were in the lowest quarter; 29 per cent in the second lowest quarter; 19 per cent of failures in the third lowest quarter, and there were no failures in those who rated at 175 or better. On the face of it, this seems to be an experience which almost establishes the value of the aptitude test. Notwithstanding the fact that 9 students had a rating below 100, 6 of those failed, and 3 averaged from 80 to 81. In our system of grading, 90 is almost the maximum grade; anything below 80 is regarded as doubtful, although 75 is the passing grade, so that even despite the low rating of some of the men 3 rating below 100 averaged 80 or better.

In the upper group, that is, those who rated above 175, 52 per cent of the group made two year averages of 85 or better, a very satisfactory scholarship standing. No student in the lowest group attained an average as high as 85. In the lowest group 65 per cent made two year averages below 80, half of them failing. In the upper group, only 6 per cent made equally low averages, with no failures.

Of the 5 students who attained the highest score, all of them had high scholarship in their premedical work and all of them were highly recommended from the schools from which they originated.

If we had accepted no one in the lowest quarter of the aptitude group, we would have declined 15 men who averaged 80 or above in two years of the medical course, one of them making an average of 87 in his second year and another an average of 84 which, with us, is a very excellent scholarship standing. If we had accepted only students in the upper half of the group, we would have had only 5 per cent of failures.

I think the results of the tests are very significant, but that it is rather hard to apply them to an individual student. Certain it is that in a small percentage of cases those rating low in the aptitude test may, nevertheless, do satisfactory work in the medical course. On the other hand, our experience with these 155 students indicates that those who stand high in the aptitude test would almost certainly stand high in the medical course.

I hope that the aptitude test will continue. I believe it is a valuable criterion by which to judge of the acceptability of an applicant for admission, but by no means should it be the sole test on which his application should be judged.

Professor W. C. MacTavish (Washington Square College) New York City: I would like to say a word or two about the aptitude tests from the viewpoint of a man teaching in the premedical college. First, I want to say that all of my colleagues teaching the science courses, and quite a few men who are teaching in other undergraduate colleges, all agree that the test is very well

devised and that it is, perhaps, as fair a method of judging these students as is possible.

I would like to say a word or two about how we give the test at our school. Last year we had about 300 students of our own and 25 students from other schools who wished to take the test. I had announcements placed in the student newspaper several weeks preceding the test calling the attention of the eligible students to the necessity for taking the test if they wished to apply to a medical school next September. I stated very definitely that the rules for the conduct of the examination are decided by this organization and must be observed strictly.

In handling such a large group of students we have to use more than one room. I select from our staff of instructors those who proctor our regular examinations; men who have shown themselves to be capable of good judgment and who are alert and careful proctors. I put them through a drill of half an hour or so, and tell them just what the regulations are and the method of giving the test. We have a sufficient number of assistants so that we have one proctor for every 15 students. In that way the papers may be distributed quickly, while the students are properly supervised. They are seated so that there is a vacant seat between each student and there is no chance for any dishonesty. The students are forbidden to bring anything to the examination room except pencils. There is a hall guard at the door who forbids them entrance to the room with any books or papers of any kind.

One thing I would like to know from Dr. Moss is whether or not students who wish to have a chance to see the examination for the previous year should be permitted to do so, because I have been besieged by students asking "What is it like?" "Isn't it possible to see last year's paper?" and so on. As far as I can see, I do not think it would do any harm, but so far I have not permitted them to see last year's tests.

Dr. Moss asked me not to make public the marks that the students received on the test. I can see the need for that because I can well understand he would be overwhelmed with complaints, possibly sued, and Lord knows what else, by students who thought they had received an unfair grade. It has been difficult for me to deal with the students who wanted to know about the test. I have told them, "The fact that you have been accepted by an approved medical school indicates that you have done well."

Another thing I wanted to mention that Dr. Moss touched on is the question of the time of giving the test. In our school the students are all required to take three years of college work before being permitted to apply for entrance to a medical school. It so happens in the arrangement of courses that most of them take their courses in organic chemistry and psychology in the third year, and some take comparative anatomy also during their third year. The content of the test has included quite a number of questions on organic chemistry and in some cases psychology. Of course, the students who have not taken the courses at all are inclined to take a chance on a "yes" or "no" question. I was glad to see that Dr. Moss has modified the test this year so that some account will be taken of the students who have not had the courses, the questions regarding which are included in the examination.

Another thing I want to emphasize is the need for a definite statement on the top of the paper that the student's name and address is required because

in our school there is a great duplication of names, and very often the students do not identify themselves sufficiently. For instance, on the list of names sent to me of those who took the test last year and who were supposed to have taken the test at our school, there were half a dozen names of students of whom I had never heard.

There is one other thing I would like to talk about briefly. Last night, in a talk with a member of the Association, he criticized the type of letter of recommendation I have been sending to you gentlemen. I want to explain how we happen to use such a type of recommendation. At one time or another in recent years you gentlemen have sent me some kind of form to fill out regarding the students applying to your various schools in which you have asked me to check "Good, bad, and indifferent," or to rate in percentage various attributes and characteristics of applicants. I collected all these forms and have developed a form which would include all the information requested.

I want to say that as far as our school is concerned, we are very anxious to cooperate in every way with this group. We try to weed out the students as much as possible in their early college years, but, undoubtedly, a large number are able to get past three years of work with a satisfactory scholastic average. It by no means follows that all of them should be accepted in a medical school, but the upper group are desirable and capable students. There are twice as many students as there are places, so we wish to give as much information as possible so that you may make your selection of the best students.

The aptitude test, I believe, is the most reliable source of information. The scholastic records are reliable in certain cases and should always be considered with the aptitude test.

With regard to what Dr. Patterson said about students who had a low rating on the aptitude test who subsequently did well in medical school, I believe they are students who in many cases have had their premedical course in a school where the training has not been good. They are good men who, in spite of the fact that they have had poor training, have been admitted to the medical school and when exposed to good training have responded and have demonstrated their natural ability. I think that has been shown time and time again. I know in our own medical school there were certain schools from which we used to accept students a large proportion of whom would fail, but every once in a while one of those men would respond to good training and develop into one of our best students.

In regard to the letter of recommendation I send out, I will be glad to modify it if you feel that the information that I give you is unnecessary, for example, whether a man is short or tall, fat or thin; whether his technique is good, bad, or indifferent; whether he speaks English properly or talks with an accent or suffers from an impediment in his speech; whether he is a grind or a student who reasons. If you are interested in having that information, I will be glad to give it. I would like to know what you want. Of course, it is hard to please everyone, although quite a few men have written to me saying they approve highly of this method of recommendation. I think you have found that we do not recommend men who do not do well later on.

I have also been told "You recommend too many men." If you read 150 positive recommendations and say, "That fellow recommends everyone," you must remember the group we have comprises about 300 students who have

satisfied all scholastic and legal requirements and if I recommend highly only 150 out of the 300, I feel I am being extremely severe with the students because those men who apply for recommendation have satisfied the legal requirements in our state and those of this Association and in most cases have taken additional work. The state requirements in New York are only two years of a college course. We do not permit any student to apply to a medical school who has not taken three years of college work. If the students do not maintain a satisfactory scholastic average they are dropped by our Scholarship Committee.

I am very happy to be allowed to come to these meetings. I enjoy meeting you. The work of Dr. Moss and the Committee on the Aptitude Test is a revelation as to what can be done with this sort of a test.

Dr. W. A. Bloedorn (George Washington University) Washington, D. C.: This matter of selecting the students is becoming increasingly important as the pressure to get into schools is also increasing. Practically every school now is faced with the task of selecting one out of five applicants, and some schools one out of ten.

The matter of demanding not only certain educational qualifications but demanding certain physical standards has come up. It is not too much for the medical school to demand from its applicants a certain degree of vision, a certain acuity of hearing, as they are certainly dependent on the special senses for much of their success. I venture to predict that the time will come when definite physical standards for admission will be required.

At the university we use four standards for admission, that is, for grading and selecting our students: (1) premedical grades; (2) the aptitude test; (3) rating by the premedical instructors; (4) the personal interview.

Our Admissions Committee places the premedical grades at the top of the list, and this applies particularly to the group that come from our own school where the medical grades are carefully supervised.

In the 1929-1930 class, 33 men were admitted to the medical school from the liberal arts department. If their actual standing had conformed to the aptitude test, all these marks would have been on the same line. As it is, a relatively small percentage of them fell on this line.

Particularly as it applied to men from our own departments, the Committee placed: (1) the premedical grades as the best index; (2) the rating by premedical instructors; (3) the rating by personal interview; (4) the aptitude test.

Dr. E. W. Koch (University of Buffalo) Buffalo, N. Y.: The results we have obtained with this test have been very encouraging. An analysis of the relation between the test scores made by our present third year students when they were freshmen and the average of their marks in the first two years of their medical course shows the following: Of the 10 men who made the highest scores, all are now doing eminently satisfactory work, and it is interesting to note that the man who made the highest test score, in this instance, 194, ranks first in his class.

Of the lowest 10 on the basis of their aptitude tests, 6 failed their first year's work. Of these, four were required to drop out of medical school, while two were allowed to repeat the year. Of the four who did not fail, two received condition marks while the two others, though receiving credit for all of their work, made only the lowest passing marks. If we had used 105 as the dead

line, we could have eliminated 7 out of the 10 of these poor risks.

If we compare the upper two-fifths with the lower two-fifths, we find that in the upper group there were no failures; that 3 per cent made averages between 75 and 79; 87 per cent made averages between 80 and 89; while 10 per cent made 90 or better.

In the lower two-fifths, 39 per cent failed and were eliminated; 12 per cent made marks between 75 and 79; 49 per cent made marks between 80 and 89; while none in this group made 90 or more.

I believe it is fair to conclude, therefore, that the evidence presented favors the view that, in general, a high score on the medical aptitude test means a satisfactory medical school record, while a low test score implies poor ability to carry on in the medical school.

Dr. H. E. French (University of North Dakota) Grand Forks, N. D.: At first I was disturbed by the idea of moving the examination up to December, but after Dr. Moss' explanation, I think we shall find the earlier date satisfactory. Many students will not have completed all of their work in physics, biology and organic chemistry by February, the date used last year. This will be true not only for students who are trying to satisfy the requirements with two years of premedical work, but also for students who spend three or four years in the college, and who may well have left organic chemistry or advanced biology for their last year. I should in any case prefer to see the Committee discount for the students who have not yet completed all of their required work, or score such students on a modified basis as Dr. Moss suggested. If this is to be done the examination might as well be held in December as in February.

We have almost exactly the opposite conditions to those described by Dr. Patterson. Ours is a small, state supported school. Almost all of our students are from our own state, and approximately three-fourths of them from our own university. Residence in the state has to be a big factor with us at once. After residence, and the required quantity of work, we look to the quality of the work as shown by college grades. The last named item, quality of work, has always been and must continue to be the chief determining consideration.

I have, however, always been interested in this study, and I can bring a little confirmatory data. Two years ago our first year medical class, about 30 students, took the test at the request of the Committee, as a voluntary exercise. The six men with the highest scores in the test were exactly the six men finally making the highest averages in the two years' curriculum. The six men with the lowest test scores were exactly the six making the lowest grades, four of them failing sooner or later and dropping out, and only two of them just getting by.

Dr. B. D. Myers (Indiana University) Bloomington, Ind.: It seems to me that as the set-up for next year now stands there is a good chance of lack of uniformity of action in the different schools in this matter of physics. Some of the schools, under this set-up, will check physics as not being taken and it will be thrown out. Others will check it as being taken in part. The course in physics is commonly given in the second premedical year, and in December only a few months of the nine months course will have been completed. It seems to me that this fact should be recognized in a uniform manner, and physics in such cases should be checked as not completed.

Dr. F. A. Moss (George Washington University) Washington, D. C.: In

regard to the occasional student who does rather poorly on the aptitude test and seems to do satisfactory work, you notice he doesn't do high work, but he does passing work. I don't think we have had any instances where a man who comes from the lower 10 per cent on the test does work of 85 or above.

We have made a provision this year that will take care of the point Dr. Bass has made. I am not certain whether it is a wise provision or not, but at the end of this year's test we have this: "If there is a valid reason for believing that you have not done yourself justice on this test, state it." That is the last thing on the test. Of course, I imagine we will get a lot of reasons. But at least we are attempting to take care of the rare cases that fail to do as well as they should.

The next point is in regard to the small number of cases that do well on the test but poorly in the medical school. If you take the premedical grades, you will always find that some men who rank very high in premedical grades do poorly in the medical school. The mere fact that the premedical grades do not predict 100 per cent would not be a valid reason for disregarding the premedical grades in the selection of students. The unfortunate thing is that we don't have a single criterion that will predict 100 per cent, and I don't think we will ever find one. We can only use the best criteria now available, which happens to be a combination of premedical grades and test scores. Neither of these is perfect, but few criteria are perfect. The mere fact that the Wassermann test may occasionally be positive with yellow fever and other things besides syphilis is not sufficient reason to discard the Wassermann test. I think that the same reasoning applies here.

With regard to making copies of last year's test available, I don't believe it is a good thing. Although the new test has an entirely different content, I don't believe it is advisable to show last year's test. We tried to take care of a certain legitimate demand for information about the test by stating to the premedical schools the nature of the test. We sent to each of the premedical schools a ganeral outline giving the subdivisions of the test.

As concerns the misreading of a student's handwriting and giving him a queer name as the result, of course, with 10,000 students' writing, mistakes will be made in reading their names. Some of them have long and unusual names, and that makes it worse. We are hoping to reduce this sort of error by having the students print their names.

With regard to Dr. Bloedorn's report on our own medical school at George Washington, you notice he based the report on only 35 students, representing about one-third of one class for only one year. I happen to have the record on a whole class (the present senior class at George Washington) for three years' work. This class consisted of 85 students that took the test in the fall of 1928.

Of the lowest 10 of these students, 5 didn't complete the first year. Three more failed by the end of the first year. One failed at the end of the second year, leaving only 1 who has a three-year average of 81. This shows how well the test predicted the failures in the present senior class at George Washington.

Of the highest 10 students on our test, no student has shown an average in any one of the three years below 80. The lowest three-year average of this group is 83, and all the rest have a three-year average above 85. The three-year records for the ten students are as follows:

Student	1st year average	2nd year average	3rd year average	Average for 3 years
A	85	85	86	85.3
B	83	80	87	83.3
C	87	88	89	88.0
D	89	89	89	89.0
E	89	88	90	89.0
F	85	85	85	85.0
G	87	85	84	85.3
H	87	87	89	87.6
I	89	89	90	89.3
J	90	89	91	90.0

Student "J" has the highest record in the class. Students "D", "E", and "I" have the records next below "J". One other student not in the highest ten also has a three year average of 89. His test score is within five points of this group.

Using the Pearson formula we found the following correlations between the various criteria and the three year average in the medical school.

Correlation between Premedical Grades and Medical Grades....0.50
Correlation between Aptitude Test Scores and Medical Grades..0.60
Correlation between Combination of Premedical Grades and Test Scores, and Medical Grades.....0.67

You will note that the test scores give a ten point higher correlation than the premedical grades, and that a combination of the two gives a seventeen point higher correlation than the premedical grades alone. Under no conditions would our Committee favor substituting the test scores for the other criteria, but we do urge the use of the test along with the premedical grades and other criteria.

I happen to be the premedical adviser at George Washington, and being premedical adviser I have tried to get the best data I could on which to base judgment of a student's fitness for the medical school. We have the following data on all the premedical students: Two intelligence tests are given them at the time they enter the university. In addition we have the Army Alpha, another intelligence test, on all of them; and I also have the results of the Medical Aptitude Test when I prepare my ratings on the students. Naturally if I am going to try to rate a man I base my rating on everything I know about him. Knowing how the ratings were prepared I have never wasted the time to run a correlation between them and the medical grades. You will notice that the high regard which Dr. Bloedorn has for the premedical ratings and interview ratings is supported solely by his personal opinion, for he offers no correlations or other objective data to back up his opinions. Without doubt some help can be secured from the ratings of premedical advisers and teachers, and also from personal interviews. But the amount of help should be measured mathematically in terms of correlations rather than in terms of subjective opinions. Also the correlations should be based on the performances of all the members of a class and not on selected cases comprising considerably less than half the class. If one is sufficiently skillful in selecting his cases he can prove almost anything he wishes. Our Committee recognizes that the Aptitude Test is far from perfect, but when all cases are considered it is the best single criterion for success in the average medical school.

Premedical Qualifications in Relation to Achievement in Medical School*

WALTER H. MOURSUND
Dean, Baylor University College of Medicine, Dallas, Texas

At the end of each of the past nine sessions a study was made of premedical qualifications in relation to accomplishment by each freshman class admitted to the Baylor University College of Medicine. The primary object of these studies was to determine, if possible, improvements in our methods of selection of students. It is only fair to say that in the early years of these studies little, if any, attention was given to any qualifications other than subject and total hour credits. However, during the later years, as the result of accumulated information and experience, a greater number of students has been refused each year. In these studies the number of years of premedical work, general scholarship and schools from which the students came were considered in relation to achievement in the medical courses. It was, indeed, very discouraging to find that none of these factors seemingly had a constant relation from year to year. The report presented herewith is a composite picture of the yearly studies, plus certain other factors previously not considered.

The report covers 962 admissions to the freshman class. The students represented obtained their premedical credits in 153 colleges of liberal arts and sciences. Anyone who has to do with the evaluation of credits knows of the many ways these credits are reported by different institutions and also of the different systems of reporting grades. For the purpose of this study all credits were converted into semester hours. In the matter of grades, greater difficulty was encountered. The grades were reported in many different ways. In order to convert these grades into as nearly as possible a common denominator the following system was used:

A=90	C=70	E=50
B=80	D=60	F=45

Plus and minus signs after grades and any in between figures were not considered. Where letters other than the first letters of the alphabet, roman numerals and figures 1 to 5 were used, these were converted into the system given above. It is recognized that by this system the general scholastic average in most instances will represent the minimum average. It is also recognized that there is a difference in the grading standards of different institutions.

*Read at the Forty-second Annual Meeting of the Association of American Medical Colleges, held in New Orleans, Nov. 30, Dec. 1 and 2, 1931.

During the period of this study the curriculum has not been changed materially nor has there been any marked change in the examiners so that the grading in medical courses has remained practically uniform.

TABLE I
LOSS FOR EACH OF THE NINE SESSIONS

Session	Total	Failed		Withdrew		Total loss	
	Admissions	No.	Percent	No.	Percent	No.	Percent
1922-23	62	15	24.1	5	8.0	20	32.1
1923-24	98	16	16.3	19	19.3	35	35.6
1924-25	108	14	12.9	17	15.7	31	28.6
1925-26	105	12	11.4	20	19.0	32	30.4
1926-27	118	9	7.6	16	13.5	25	21.1
1927-28	119	26	21.8	14	11.7	40	33.5
1928-29	112	24	21.4	12	10.7	36	32.1
1929-30	120	21	17.5	11	9.1	32	26.6
1930-31	120	22	18.3	11	9.1	33	27.4
	962	159	16.5	125	12.9	284	29.5

It does not seem that any worthwhile conclusions can be drawn from this table. Greater care was observed in the selection of students during the last five years than during the first four years, yet the total loss for each varied from year to year to such an extent that it does not appear that our efforts of selection had any marked influence on the percentage of failures. It will be noted that the smallest percent of failures occurred for the session 1926-1927. The premedical scholastic average of this class was slightly higher than that of any of the other classes, yet the class with the highest percentage of failures had the next highest premedical scholastic average.

In all the accompanying tables the number and percentage of withdrawals is given. Various reasons for withdrawing were given by the students. In some instances, reasons other than scholarship were valid, but, no doubt, in many cases the actual reason was anticipated failure. The fact remains, that such withdrawals constitute an economic loss of varying degree.

The age of the student at the time of admission to medical college is given in this table. The average age at graduation was between 26 and 27 years. It is interesting to note that of the 18 year old students none failed, and 50 per cent ranked in the upper third of the class in medical college. Seven have completed the four years in medicine, one withdrew during the second year on account of physical disability and eight are

TABLE 2
RELATION OF AGE ALONE TO ACHIEVEMENT
FIRST YEAR MEDICINE

Age	Total	Failed		Withdrew		Upper Third		Middle Third		Lower Third	
	Admissions	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
18	16	0	0	0	0	9	56.2	2	12.5	5	31.2
19	59	10	16.9	4	6.6	15	25.4	15	25.4	15	25.4
20	116	14	12.0	6	5.1	29	25.0	44	37.9	23	19.8
21	164	31	18.9	13	7.9	44	26.8	38	23.1	38	23.1
22	176	29	16.4	18	10.2	45	25.5	43	24.4	41	23.2
23	95	15	15.7	13	13.6	25	26.3	24	25.2	18	18.9
24	87	19	21.8	8	9.4	20	22.9	21	24.1	19	21.8
25	52	8	15.3	4	7.6	14	26.9	18	34.6	8	15.3
26	47	9	19.1	6	12.7	14	29.7	6	12.7	12	25.6
27	32	6	18.7	3	9.3	9	28.1	8	25.0	6	18.7
28	30	7	23.3	8	26.6	5	16.6	4	13.3	6	20.0
29	15	5	33.3	3	20.0	6	40.0	1	6.6	0	0
30	13	3	23.0	1	7.6	4	30.7	5	38.4	0	0
31	8	1	12.5	2	25.0	1	12.5	3	37.5	1	12.5
32	2	1	50.0	1	50.0	0	0	0	0	0	0
33	5	1	20.0	2	40.0	0	0	1	20.0	1	20.0
34	5	1	20.0	1	20.0	1	20.0	1	20.0	1	20.0
35	4	0	0	3	75.0	1	25.0	0	0	0	0
36	3	0	0	0	0	1	33.3	2	66.6	0	0
37	1	0	0	1	100.0	0	0	0	0	0	0
38	1	0	0	0	0	0	0	0	0	1	100.0
39	1	0	0	0	0	1	100.0	0	0	0	0
41	2	0	0	2	100.0	0	0	0	0	0	0
	934	160	17.1	99	10.5	244	26.1	236	25.2	195	20.8

still in medical college and advancing in class without interruption.

The premedical scholarship of these students varied as much as that of any other age group, and the number of hours of premedical credits ranged from 60 to 120 hours. Two students had an A. B. degree; one had a B. S. degree. While the number of students admitted at the advanced ages is not sufficiently large for statistical accuracy, yet there seems to be a tendency, at least, to increased percentage of failures and withdrawals among the older age groups. I have the conviction that a student should be admitted to medical college just as soon as he has convinced himself that he wants to study medicine and can meet the minimum entrance requirements, and that the younger he is at the time the

TABLE 3
RELATION OF NUMBER OF HOURS PREMEDICAL WORK TO ACHIEVEMENT
FIRST YEAR MEDICINE

Number of hours	Total Admissions	Failed		Withdrew		Upper Third		Middle Third		Lower Third	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
60	70	17	21.7	5	6.4	23	29.4	22	28.2	11	14.1
61-70	185	34	18.3	23	12.4	35	18.9	47	25.4	46	24.8
70-80	160	35	21.8	14	8.7	30	18.7	47	29.3	34	21.2
80-90	101	17	16.8	9	8.9	26	25.7	17	16.8	32	31.6
90-100	78	10	12.9	6	7.6	24	30.7	15	19.2	23	29.4
100-110	51	3	5.8	3	5.8	19	37.2	18	35.2	8	15.7
110-120	34	7	20.5	3	8.8	10	29.4	17	20.5	7	20.5
120+	184	23	12.5	31	16.8	64	34.7	42	22.8	24	13.0

better. I believe that to compel a student to spend one or two additional years in academic studies just because he happens to be young in years is, in many instances, an educational and economic waste.

In this table repeating and irregular students are not included. The best showing was made by the group with from 100 to 110 hours of premedical credit, while the 120+ hours group showed the next lowest percentage of failures though practically the same as the 90 to 100 hours group. The highest number of withdrawals occurred in the 120+ group. Perhaps, the additional college work increased the ability of these students to sense failure or recognize unfitness for the study of medicine. The 120 hours group has the lowest percent in the lower third of the class and the 60 hours group the next lowest. If one considers the students ranking in the middle third as being average students and those in the upper third as better than average students, then the 60 hours group has as high a percentage of average and better than average students as the 120+ hours group. The 100 to 110 hours group has from 15 to 30 per cent more of such students than the other groups considered separately.

TABLE 4

RELATION OF NUMBER OF YEARS PREMEDICAL WORK TO ACHIEVEMENT
FIRST YEAR MEDICINE

No. Years	Total Admissions	Failed		Withdrew		Upper Third		Middle Third		Lower Third	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
2	78	17	21.7	5	6.4	23	29.4	22	28.2	11	14.1
2-3	446	86	19.2	46	10.3	91	20.4	111	24.8	112	25.1
3-4	163	20	12.2	12	7.3	53	32.5	40	24.5	38	23.3
4	184	23	12.5	31	16.8	64	34.7	42	22.8	24	13.0

This table is the same as Table 3 in a somewhat condensed form, using number of years of premedical work instead of hours. While the percentage of failures is highest in the 2 year group, the total loss (failures and withdrawals) is higher in the 4 year group. The most unsatisfactory showing, on the whole, was made by the 2 to 3 year group. The percentage of students in the upper third and middle third is practically the same for each 2 year, 3 to 4 year and 4 year groups; the 2 to 3 year group had a higher percentage in the lower third than either of the other two groups. It would appear from Tables 3 and 4 that the product entering the sophomore class is, on the whole, practically as good from those with 2 years of premedical work as from those with 4 years.

TABLE 5.

RELATION OF PREMEDICAL DEGREE TO ACHIEVEMENT
FIRST YEAR MEDICINE

Degree	Total Admissions	Failed		Withdrew		Upper Third		Middle Third		Lower Third	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
A.B.	125	12	9.6	22	17.6	40	32.0	32	25.6	19	15.2
B.S.	34	6	17.6	4	11.7	13	38.2	6	17.6	5	14.7
M.A.	8	0	0	2	25.0	6	75.0	0	0	0	0

The highest percentage of failures occurred in the group having a B. S. degree, which, presumably, includes the students having more training in science courses than do those having the B. A. degree, yet a higher percentage of the B. S. students ranked in the upper third. The two students with a Master's degree who withdrew did so because of financial reverses. Had they been able to go on, I am confident that they would have ranked in the upper third, thus making 100 per cent of the M. A. students rank in the upper third. From the scholarship standpoint, it would appear to be ideal to require a Master's degree for admission to medical college. It would, of course, be folly to advocate this.

TABLE 6

RELATION OF PREMEDICAL GENERAL SCHOLARSHIP TO ACHIEVEMENT FIRST YEAR MEDICINE

Grade	Total	Failed		Withdrew		Upper Third		Middle Third		Lower Third	
	Admitted	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
B+	34	1	2.9	4	11.7	24	70.5	3	8.8	2	5.8
B	107	1	0.9	14	13.0	53	49.5	32	29.9	7	6.5
C+	170	25	14.7	23	13.5	54	31.7	35	20.5	33	19.4
C	231	37	16.0	26	11.2	51	22.0	63	27.2	54	23.3
D+	195	44	22.5	17	8.7	34	17.4	51	26.1	49	25.1
D	133	41	30.7	9	6.7	14	10.5	30	22.5	39	29.3

The students were divided into grade groups on the basis of premedical general scholastic average in accordance with the following system:

A+ 95-100	B+ 85-90	C+ 75-80	D+ 65-70
A 90-95	B 80-85	C 70-75	D 60-65

There were no A+ or A students. It should be remembered that the premedical averages were obtained in the manner indicated in the first part of this report. Note that (1) there is a definite increase in the percentage of failures from the higher to the lower scholarship groups; (2) there is a definite decrease in the percentage ranking in the upper third from the higher to the lower scholarship groups, and (3) the percentage ranking in the lower third increases when the groups are so considered. It would seem that premedical scholarship is our best and safest guide as to what the student will do in medicine.

Observations 1 and 3 in comments on Table 6 are presented graphically in Graph 1.

The relation of scholarship in the subjects considered separately is not as clear-cut as the general premedical scholarship. A larger number of students made low grades, that is C or less, in English than in either of the sciences, while a larger number made C+ or better in biology than in either of the other courses. It does not seem that any one course

GRAPH 1

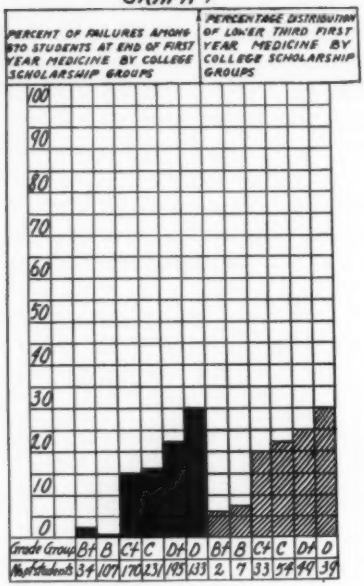

PERCENT OF FAILURES AMONG 870 STUDENTS AT END OF FIRST YEAR MEDICINE BY COLLEGE SCHOLARSHIP GROUPS
PERCENTAGE DISTRIBUTION OF LOWER THIRD FIRST YEAR MEDICINE BY COLLEGE SCHOLARSHIP GROUPS
100
90
80
70
60
50
40
30
20
10
0
Grade Group BA B C+ C D+ D BA B C+ C D+ D
No. of students 34 107 170 231 195 133 2 7 33 54 49 39

TABLE 7

RELATION OF SCHOLARSHIP IN REQUIRED PREMEDIC SUBJECTS TO ACHIEVEMENT FIRST YEAR MEDICINE

			Failed		Withdrew		Upper Third		Middle Third		Lower Third	
	GRADE	TOTAL	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
ENGLISH	A	11	0	0	2	18.1	4	36.3	2	18.1	3	27.2
	B+	21	1	4.7	3	14.2	13	61.9	3	14.2	1	4.7
	B	95	9	9.4	12	12.6	37	38.9	26	27.3	11	11.5
	C+	115	13	11.3	18	15.6	41	35.6	26	22.6	17	14.7
	C	228	33	14.4	33	14.4	56	24.5	60	26.3	46	20.1
	D+	128	23	17.9	14	10.9	30	23.4	26	20.3	35	27.3
	D	212	49	23.1	22	10.3	30	14.1	51	24.0	60	28.3
CHEMISTRY	A	10	0	0	1	10.0	7	70.0	2	20.0	0	0
	B+	47	1	2.1	2	4.2	32	68.0	9	19.1	3	6.3
	B	102	8	7.8	9	8.8	41	40.1	27	26.4	17	16.6
	C+	132	12	9.0	26	19.6	42	31.8	28	21.2	24	18.1
	C	242	31	12.8	36	14.8	49	20.2	68	28.0	58	23.9
	D+	153	37	24.1	16	10.6	35	22.8	31	20.2	34	22.2
	D	163	49	30.0	24	14.7	14	8.5	38	23.3	38	23.3
PHYSICS	A	38	2	5.2	4	10.5	19	50.0	11	28.9	2	5.2
	B+	42	0	0	4	9.5	24	57.1	10	23.8	4	9.5
	B	144	11	7.6	24	16.6	50	34.7	36	25.0	23	15.8
	C+	119	18	15.1	14	11.7	37	31.0	29	24.3	21	17.6
	C	225	34	15.1	28	12.4	53	23.5	57	25.3	53	23.5
	D+	108	20	19.4	9	8.7	19	18.4	29	28.1	26	25.2
	D	168	53	31.5	21	12.5	13	7.6	33	19.6	48	28.5
BIOLOGY	A	39	1	2.5	6	15.3	22	56.4	4	10.2	6	15.3
	B+	61	1	1.6	9	14.7	23	37.7	17	27.8	11	18.0
	B	181	20	11.0	23	12.6	67	37.0	50	27.6	21	11.6
	C+	125	14	11.2	12	9.6	37	29.6	24	19.2	38	30.4
	C	229	44	19.1	29	12.6	41	17.8	58	25.3	57	24.8
	D+	125	33	26.4	15	12.0	21	16.8	29	23.2	27	21.6
	D	86	26	30.2	12	13.9	6	6.9	21	24.4	21	24.4

has a greater predictive value as to outcome of the students in medicine than any other course.

TABLE 8. Achievement of Readmissions After Failure

Total Readmissions	61
Failed Again First Year	11 or 18.0%
Withdrew During Year	4 or 6.5%
In Upper Third First Year	15 or 24.5%
In Middle Third First Year	23 or 37.7%
In Lower Third First Year	8 or 13.1%
Entered Sophomore Year	33 or 54.0%
Failed Sophomore Year	11 or 33.3%
Withdrew Sophomore Year	1 or 3.0%
Upper Third Sophomore Year	4 or 12.1%
Middle Third Sophomore Year	6 or 18.1%
Lower Third Sophomore Year	11 or 33.3%
Total Loss, Failures and Withdrawals	27 or 44.2%
Did not enter sophomore year	13 or 21.3%

Everyone who has had to do with the readmission of failed students knows of the pressure that is often brought to bear to bring about the readmission of a certain student. An analysis of Table 8 shows that of the 61 students readmitted to the freshman class only 21 finally completed the sophomore year, and of the 21, only 10 ranked in the upper and middle thirds of the sophomore class. A study of such repeaters as have had time to enter the junior and senior classes indicates a definite tendency to lower class standing of such students in the advanced years. It is only an occasional student who maintains a better than average standing.

Recently, our Committee on Admissions has adopted a different method of handling applicants for readmission after failure. Increased care is exercised in the selection of failed students to be given an opportunity to become eligible for readmission. These selected students are given the privilege of entering the summer session on probation, with the requirement that they take two freshman courses designated by the Committee. If the student makes a grade of 80 or better in each of these courses he is eligible for readmission to the long session with credit in the two courses. It is recognized that this lightens the student's load in the freshman year, but it gives him every opportunity to get a good foundation in the fundamental courses of the first year, if he has the ability to do so. If capable, he will be able to carry on satisfactorily in the other years. The crucial test will be the sophomore year.

This method has been applied only for the past two summers and results as to its effectiveness are not yet available. However, it has already been the means of convincing several very insistent students that they did not possess the ability and aptitude necessary for the study of medicine. I doubt if they could have been convinced in any other way

and under this method the financial outlay and loss of time is not great. We are hopeful that the method will eliminate to a very great extent the unfit and the very mediocre student and at the same time save the occasional capable student who for justifiable reasons could not give his best efforts during his first trial.

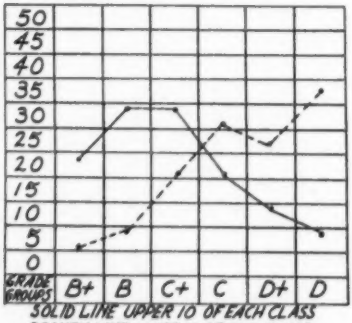
TABLE 9. Achievement Sophomore Year of Lower Third Group First Year

Total Admissions	159
Failed	56 or 35.2%
Withdrew	10 or 6.2%
Upper Third	8 or 5.0%
Middle Third	39 or 24.5%
Lower Third	46 or 28.9%
Did not enter sophomore year	15

In this table another problem presents itself. Of the total number, 174, in the lower third group at the end of the first year only 93 completed the sophomore year. Of these 93, one-half ranked in the lower third of the sophomore year and only 8 ranked in the upper third. Slightly more than one-third of those of the lower third group first year admitted to the sophomore year failed. Unquestionably, many of the lower third group should be diverted into other channels of endeavor. The problem is how to select the ones to be given an opportunity to go on in medicine. To refuse further admission to all of this group would be a rather radical procedure and have very doubtful justification. The deciding factor would be the accomplishment, after graduation, of those of the lower third group who complete the four years in medicine.

In Graph 2 the percentage distribution of premedical scholarship groups among the upper ten and lower ten at the end of each freshman

GRAPH 2.
SHOWS DISTRIBUTION OF PREMEDICAL GROUPS AMONG UPPER 10 AND LOWER 10 OF EACH FRESHMAN CLASS FOR 9 SESSIONS



SOLID LINE UPPER 10 OF EACH CLASS
BROKEN LINE LOWER 10 OF EACH CLASS

year for the nine sessions (90 students in each group) is presented. It is interesting to note that as high a percentage of the C+ group as the B group ranked among the upper 10, and that a higher percentage of each of these groups ranked among the upper 10 than did those of the B+ group. Only a small percent of the B+ and B students are among the lower 10, while a similar low percent of the D students are among the upper 10.

Of 620 students who have had time to graduate in medicine, only five made an average grade of 90 or better for the four years in medical college. Scholastically, these may be regarded as being superior students. Of these, only two are making better than average records as graduates.

Comments

1. The general premedical scholarship is the best criterion on which to predict achievement in medical courses.

2. A mediocre student in premedical work does not often do otherwise than continue to be mediocre in medical school.

3. It is doubtful if the results reported justify readmission of a student after failing the first year in medicine.

4. While no mention has been made in this report of character and personality as factors in the selection of students, yet they were, of course, considered. We recognize that strong personality, honesty, high ideals, capacity for leadership and sense of opportunity are essential for the highest achievement in medicine. I believe all will agree that our present methods of determining these qualifications by personal interview and letters of recommendation are not satisfactory. The solution of the problem, to a very great extent, lies in the hands of the faculties of premedical schools.

5. It is believed that much valuable information could be obtained if each medical college would make a similar study covering a definite period of years. The combining of these results in one study would, I am sure, permit of some very definite and valuable conclusions.

6. In the last analysis we are just as much, if not more so, concerned with the accomplishment after graduation as we are with the accomplishment in medical school. The accomplishment of the product of our medical schools will in the end be our most important determining factor of the success of any method of selection of the students.

Teaching of Surgery*

FRED C. ZAPFFE
Secretary Association of American Medical Colleges
Chicago

A discussion of the teaching of surgery in undergraduate and graduate medical schools must be based on a thorough understanding of the topic; first, from the standpoint of surgery; second, from the pedagogic standpoint. And, let us shun the use of the word standardization in connection with such a discussion.

Standardization was needed at one time; it has served a useful purpose; it accomplished much good. When its work was done, it passed into oblivion. A single outstanding escape from what threatened to be a scourge of standardization was the fact that the teacher never was standardized. No one displayed sufficient courage to undertake such a job. Nevertheless, one cannot but wonder whether some of the problems that beset us at the moment might not have been solved if teachers had been standardized. It would, at least, have given the teacher more familiarity with the situation as it exists today than he seems to have. More than ever before is every teacher impressed with the prime importance of his subject to the practitioner of medicine; therefore, he demands more hours, greater facilities, more personnel, more budget. There is imminent danger that if all the demands made by various department heads were heeded, the curriculum would distribute about 8,000 hours instead of trying to reduce the present total for pedagogic reasons.

True, knowledge has increased considerably year by year in every subject in the curriculum. There is more to teach, more to know, yet the time available has not increased at all. There are still only twenty-four hours in each day, and some of these must be spent in eating, sleeping and recreation. All teachers are agreed that the time requirement cannot be lengthened; in fact, more than one strong concerted effort has been made to reduce the time requirement by at least two years.

Problems for Solution

If, then, knowledge has increased and the time for study cannot be lengthened, what is the solution of the problem?

First of all, it is agreed among educators that the spoon-feeding method of teaching is not the right method. It is agreed that self-education is the proper method of learning. But this cannot be done outside of any institution of learning nor without teachers. Carefully planned

*Read in a Symposium on Graduate and Under-Graduate Teaching of Surgery, Clinical Congress of the American College of Surgeons, New York, October 14, 1931.

supervision is essential. This method is by far the most practical and the most fruitful so far as results are concerned.

The teacher becomes a guide or director. He does not teach by voicing certain facts and dicta that may be found in any textbook. No, he merely mentions a topic, says a few words about it, and directs the student to the library where he may read and learn at first hand what is known in that field. Then, he discusses the subject with his director or guide or teacher, and gives evidences that he has thought about it, that he has learned to understand it. He does not know all about it, but he does know what it is all about. He has brought reason to bear, rather than mere memory. He has been given opportunity to think it out for himself, and turns to his teacher for confirmation or disproval of his views.

Second, it is agreed that in every field of human endeavor fundamental principles, or fundamentals, are of prime importance. Having mastered these fundamentals, it is comparatively easy to build some sort of a superstructure. That statement is as true of surgery as it is of anatomy, or physiology, or zoology, or physics, or language, or psychology, or any other subject. It is important for the student to begin his work by learning these fundamentals and laying a good foundation. If getting such a training consumes all of the time available, then the future must be drawn on for further development.

Third, no one, no matter how many years he has studied and learned, has succeeded in becoming complete master of any subject. He has always found that there is still something to learn. That being true, how can anyone feel that he can in a mere two or three or four hundred hours give all that is known in any field to the beginner in this field? The teacher has spent many years of his life in arduous toil, and with much reflection and cogitation, to gain some of the knowledge in his chosen field. How, then, can he feel that his student, who comes untutored, though fired with ambition, can acquire even a small modicum of that knowledge in a comparatively few prescribed hours?

Purpose of Teaching

What, after all, is the purpose of teaching? Is it to pump the student full of facts which may be released at will by pressure on a handle or a button; or is it to teach the student how he may educate himself under the guidance of a teacher, and even after he has gotten out from under the immediate influence of the teacher?

Have we not done everything possible, in our blindness, to choke any stimulus that might have arisen to go on learning; to make further effort to seek knowledge, both old and new? Have we not given stu-

dents the impression that when they get out from under our teaching we have "told" them everything known in our special field of endeavor? Is not that the effort made by many teachers, to "tell" it all, leaving nothing to the student's personal efforts, nothing to his imagination, killing curiosity, smothering ambition?

Have we surveyed the situation calmly and dispassionately, from every angle, every point of contact, in its relationship with every other subject? Have teachers in medical schools, for instance, ever made a real effort to discuss teaching problems among themselves—*a familia?* True, teachers have read papers on the teaching of their special subjects before medical societies, both general and special societies. They have read papers before the Association of American Medical Colleges, but the interest in these papers was confined to the special subject in which the reader of the paper happened to have an interest. Was an anatomist ever invited to discuss a paper on the teaching of surgery; or a physiologist invited to discuss a paper on the teaching of clinical medicine? Is it not possible that the pathologist might present a very good paper on the teaching of clinical medicine and surgery? But, after all, is not surgery clinical medicine calling for a special form of therapy based on a very special type of training?

Discussion of Teaching Problems

The point I am trying to make is that teachers in medical schools have never discussed teaching problems as a whole. They have never gotten together to "talk things over." There is no school for training teachers in medical schools, and more is the pity; and there is no association of medical teachers which would devote itself entirely to the discussion of problems in the large field of medical pedagogy. Therefore, these teachers do not have any opportunity to discuss these problems. They hear only one side of a discussion and never anything about its relation to many other sides which are represented by related subjects. That is a signal failure in the whole scheme of medical teaching.

The Association of American Medical Colleges has, since 1907, made it a point to have papers on teaching on its program at each annual meeting; in fact, as a rule, one entire session is devoted to the reading and discussion of such papers. But, real interest has never been aroused in these papers because, first, it is possible that few teachers in the fields covered were present at the meeting, and second, there may have been a feeling that pedagogy was not one of the topics in which one should have a special interest at that meeting. Yet, many very excellent papers have been presented and much valuable discussion has resulted. However, an association of medical teachers, or a section on medical peda-

gogy in the A.A.A.S., including preclinical and clinical teachers, full time, part time, free time, could discuss many problems with great profit, problems that cannot be included in the program of any other existing association for lack of time and conflict with other interests.

True, there are already too many associations, and the founding of another association would entail hardship, both as to time and money, on teachers who do not have too much of either commodity. I would not advocate the formation of another association, but I would urge that existing professional associations, composed, as they are, largely of men who are teachers, concern themselves with this problem. As it is now, it is extremely difficult to get special societies to give up any time to the discussion of subjects apparently foreign to their own special interest, notwithstanding that teaching is the real reason for their faculty appointment—unless it was specifically made for research. For instance, the anatomists' association might announce the discussion of the teaching of anatomy in the medical school and invite the physiologists, the pathologists, and the clinicians in various fields to discuss the question so that there may result something distinctly worth while to the interests of better pedagogy. The clinical groups could do likewise, and so on through the whole range of societies representing various subjects comprising the medical curriculum.

Who ever heard of a dermatological society discussing the teaching of dermatology from that point of view; or even of a surgical society doing it? If teaching is mentioned, is it not for the sole purpose of announcing that more "hours" are needed? Would less selfishness and a greater knowledge of what real teaching means unscramble or, as one of my friends has put it, "debunk" the curriculum of the medical school? I think so.

The Teaching of Surgery

The teaching of surgery should be done in three major departments, undergraduate, graduate and postgraduate. The work of each of these departments or divisions is of equal importance.

In the Undergraduate School

Let us consider first, the teaching of surgery in the undergraduate medical school. It is generally agreed that the four years spent in medical school must be regarded as being the years during which certain foundations are laid. These foundations consist, largely, of teaching the so-called basic sciences, pointing out their vital relationship to the art of medicine, and the inculcation of the first principles of the practice of medicine. The fifth or intern year is virtually only further experience with the practice of medicine.

The majority of the graduates in medicine do not go any further than this fifth year. Hence, it is essential that whatever fitness to practice comes to this large group must be developed during the four years spent in medical school.

Of what shall the teaching in surgery consist? How much time shall be devoted to such teaching? I am firmly convinced that "hours" do not enter into the scheme at all except, perhaps, as a check on the over-ambitious teacher, who is eager to tell his students in "hours" what he has learned in the course of many years, hoping to convey to the student the skill he has acquired after many hours spent in reading, practice and research. It is not a question of hours, therefore, but of subject matter, and that should be chosen carefully, presented clearly and concisely, with ample time remaining for the student to have a chance to learn "on his own" but always under the watchful supervision of an ardent, faithful and well trained instructor. He should be made familiar with those fundamental principles of surgery which will help him later to become a good practitioner or a special student engaged in research or one preparing himself for specialized practice.

By stressing the need for training in fundamental principles as an essential to general practice, and further study for special practice, the desire uppermost in the mind of every undergraduate to become a specialist in some field immediately after graduation will be dispelled quickly and he will be less apt to miss the opportunity to acquire a solid foundation for the general practice of medicine. Competent surgeons are not graduated after four or five years' attendance in medical school and hospital. But every graduate in medicine must have some surgical knowledge. Just what that knowledge should be must be determined by men who have had much experience in practice, and how it shall be taught must be determined by teachers of surgery.

We have given too much time to surgery in the undergraduate medical school; the subject matter taught has not always been well chosen; what would be considered fundamental has not always been stressed sufficiently. The same statements would apply to every other subject in the curriculum. There is so much knowledge to be imparted; the time available is so short; the teacher is anxious to do as much as he can, hoping not to fail, at least, to make mention of every point. Is it any wonder that at the end of his allotted "hours" he is horrified to find that he has failed to mention some topic?

What is essential or fundamental in surgery? Is it minor surgery? Is it more than that? Opinions vary, and even the best surgeons hold opposite views on this question. Should the subject of fractures be

stressed more than it is in some medical schools? Should so-called surgical technique be stressed? Would not more correlation with anatomy, pathology, bacteriology and clinical medicine make it possible to save time by avoiding repetition? Correlation will do much to improve teaching methods by creating better facilities for teaching.

Place of Surgery in Curriculum

There will always be difference of opinion as to the place of surgery in the curriculum of the undergraduate medical school. Surgery would benefit if it merged with so-called medicine in a department of clinical medicine. Such a step would carry the conviction to the student that surgery is a specialty and that skill in this field is the reward of many years of study and research done after graduation from the undergraduate school. Up to the point of treatment, so-called medicine and so-called surgery are one and the same. I am aware that surgeons may not agree with me on that point but, is it not true that the well trained internist knows fully as much about gastric and duodenal ulcer as the well trained surgeon? They may differ as to treatment, but should that concern the undergraduate student? Is it not important that he should be taught limitations; how far he can go with his preparation; and that he must have more preparation if he would go further?

Could not the time spent teaching things that are beyond the limitations of the undergraduate student be spent to better advantage on the fundmaentals of surgery, e.g., anatomy, pathology, diagnosis, prognosis, thus giving him better training and creating in him a desire to acquire further knowledge and greater skill by graduate study?

The question has often been asked: Why not license specialists in surgery? It is a pertinent question, one which is now engaging medical educators very seriously. Such licensure will come, although no one can say when. I think its coming can be hastened if we will teach our students in such manner that they will realize fully that they need much more study and preparation before they will be ready to practice surgery, either wholly or in part. Would a statement in medical school catalogs to the effect that no effort will be made to make a specialist be of no avail? We should not let students go out from college convinced that they can perform an appendectomy or gastro-enterostomy because they have been shown how to do these operations. It is impossible to train them well enough during their undergraduate life to be regarded as being ready to perform any major operation.

Surgery in First Year

Those colleges that have begun the teaching of surgery in the first or freshman year are well satisfied with the result. An hour a week

during the second semester devoted to a talk on, say, Lister, brings up the topic of antisepsis; Paré recalls checking of hemorrhage; Pasteur or Loewenhoeck reminds us of bacteria and infections. Instruments might be presented and described and serve as an introduction to many of the aspects of surgery. So, too, would a well arranged and prescribed course in reading. Such courses are not only informative, they are also interesting and stimulating.

Surgery in Second Year

In the second year, minor surgery and fractures demand attention. Principles can be illustrated by the presentation of cases. Aseptic technique need not be stressed too much because proper correlation with bacteriology should accomplish the desired result. Correlation with anatomy will be of great value in imparting knowledge about fractures.

Surgery in Third and Fourth Years

In the third and fourth years the clinical training needed may be acquired by conferences, so-called dry clinics, hospital and outpatient clerkships. I would like to see each student spend two months in a hospital clerkship in surgery and one month in the surgical clinic of the outpatient department. I feel that with good instruction he will receive proper teaching in surgery in many fewer "hours" than are now allotted to the subject in medical school curricula.

Now that the amphitheatre surgical clinic has passed out of the teaching picture, students do not all have the desire to become surgeons, and in time this will make itself evident by the lessening numbers of surgeons, and the possibility and need for acquiring further training to become a surgeon. Then, perhaps, we will have the necessary legal machinery to license him.

Graduate Study

It is agreed that graduate study is an essential for specialization in any field of medicine, and especially in surgery. There are many opportunities for such study in a considerable number of medical schools. One state university medical school has had a graduate school in medicine for a number of years. Another university has a graduate and postgraduate school of medicine. Another has had a medical school on a graduate basis for several years. These schools have set for themselves certain standards for real graduate work. They have given real opportunity for serious graduate work and have accomplished good work.

They are, perhaps, largely, if not wholly, responsible for the opportunities for graduate study now offered by many departments of surgery in undergraduate medical schools.

Recognition of graduate work must be based on graduation, intern-

ship, residency, and the pursuit of special courses of study and research, extending over a period of not less than four years after graduation. Then only can the student be said to be entering on the practice of surgery. He is yet far from being a master but he is on the right road, and if he continues as he has begun, he will gain mastery.

The future of surgery, real surgery, skilled surgery, lies in graduate study which will yield fewer but better surgeons. It will emphasize the need for recognition of limitations in practice and encourage cooperation without working a hardship on anyone.

Postgraduate Study

Any practitioner may indulge in so-called postgraduate study in any field. It consists of a more or less serious browsing around in a well tilled field in order to acquaint oneself with the progress made since, say, graduation, or one's last visit to the school or clinic. It may assume a more serious aspect if the visit is prolonged or if a well and definitely outlined course of procedure is followed. In a few instances, it almost assumes the proportions of graduate study. Now that one university has incorporated a postgraduate medical school in its teaching program, it is safe to predict that the plane of this type of work will be elevated.

Postgraduate study has met a need in medical practice. It was hit or miss when everything else was somewhat hit or miss. For a number of years past postgraduate schools have been working seriously to establish themselves as a worthwhile part of our teaching program. They have succeeded beyond expectations and will do more when the demand is made. They even have a place in the scheme of graduation education. Some courses now offered in postgraduate schools deserve to be credited in the graduate program.

Conclusions

From the standpoint of good pedagogy, we must divide the teaching of surgery into (1) undergraduate, (2) graduate and (3) postgraduate.

The undergraduate teaching should be reconstructed—beginning in the freshman year, imparting fundamental principles, necessitating careful selection of subject matter to be taught; the bulk of the clinical teaching to be done through clerkships in hospital and outpatient department; no operating clinics, but frequent conferences with small groups, seminar and dry clinics.

Emphasize the necessity of graduate study, if one intends to develop as a surgeon. Graduate courses must be well thought out, offered by the department of surgery in every medical school and be organized on a university basis of study. Only special licensure should eventually make it possible to do special work in any field in medicine.

Postgraduate study should be encouraged more than it is. Opportunities for such work should be increased so that every practitioner can avail himself of such courses. They will always be "refresher" courses but to insure a high standard and quality, they should be under the control and direction of approved teaching organizations and available in any part of the year, not only for a short time, in the early summer, immediately after commencement.

The teachers in all three divisions must be real teachers and preferably part of a university teaching body. They will be judged on the basis of accomplishment. Responsible teaching positions should be a reward and attainable only after many years of preparation and study.

In closing I suggest the appointment of a committee by the American College of Surgeons which will make a careful and thorough study of the teaching of surgery in all its phases and present a report, possibly with recommendations, at the next meeting of the College.*

*NOTE: The Board of Regents of the American College of Surgeons appointed the following committee to make such a study over a period of two years: Fred C. Zapffe, George J. Heuer, Elliott Cutler, Irving S. Cutter and Allen O. Whipple.

Dentistry: The Errant Branch. Shall Medicine Re-adopt It?*

F. T. VAN BEUREN, JR.
Associate Dean, Columbia University College of Physicians and Surgeons, New York City

(Continued from March, 1932, issue)

Discussion

DR. ALFRED OWRE, Dean, School of Dental and Oral Surgery, Columbia University, New York: Dr. van Beuren has given an admirable sketch of the history of dentistry for a century past, with its resultant philosophy. One has, unfortunately, to agree with him (always, of course, with his reservations) in that "while medicine (has) remained a profession, dentistry (has) become a business." It has all too truly, as he says, "lost its soul." Nobody knows that better than the man who has frequent contacts with both. This man is perfectly familiar, too, with the cocksure carriage and dubious social integrity of many members of the dental "profession." I wonder, though, whether it is this type of individual who is usually the "prodigal son"?

In my experience, the dentist who would see the standards of his profession bettered to the point of an ultimate inclusion in medicine is usually a modest fellow, with the earmarks of a gentleman. It is the blatantly self-sufficient, good-enough-as-I-am dentist who insists on his equality with all and sundry. Having lately been called by implication a sharper and the Benedict Arnold of dentistry, for what are, after all, disinterested efforts, I have begun to wonder whether the medical educator, or anyone else, would gain by "talking it over together" with this type.

I have come to realize that the capacity for abstract discussion is not often found in men with the cultural background of the average dentist. They are seldom professional men in the real sense of the word (Dr. Flexner truly says a profession must be learned), but, as Dr. van Beuren points out, are oftener men of business. They have lost the medical ideal of service.

Notwithstanding recent movements which have ostensibly served a higher ideal, it is still true that several almost entirely technical dental schools contribute the largest number of graduates. Much publicity has been given lately by the proponents of autonomous dentistry to a letter from one medical dean upholding the present system. The letter is apparently based on a complete misapprehension of the facts of dental education and practice. The writer states:[1]

Dentistry requires no "elevation" in order to become a specialty

*Read at the Forty-second Annual Meeting of the Association of American Medical Colleges, held at New Orleans, Nov. 30, Dec. 1 and 2, 1931.

1. "Comment on the Status of Dentistry." A letter addressed by Dean W. McKim Marriott, Dean, Washington University School of Medicine, to Dr. B. N. Pippin, of the Dental School of Washington University, in response to a circular inquiry regarding "the elevation of dentistry to a standard whereby it could be recognized as a specialty of medicine," and also on the question whether "dentistry should be considered a specialty of medicine," and the dental and medical curricula "reorganized to bring about this relation." Reprinted, with the author's consent, from pages 73-75 of the *Proceedings of the American Association of Dental Schools*, Eighth Annual Meeting, held in Memphis, Tenn., March 23-25, 1931, (In *Journal of Dental Research*, Vol XI, No. 5, October, 1931, p. 807).

> of medicine. It is, in the ultimate analysis, a specialty of medicine because the teeth are parts of the body, and the dentist is concerned with the maintenance of health and normal function of the teeth. In this sense it is as much of a specialty as surgery, obstetrics, or otolaryngology, but by the same token physical education, nursing, and dietetics might also be considered as medical specialties. The important question at issue is not the academic one of nomenclature or of professional degrees, but of the character of training of the practitioner in the specialty concerned. In determining upon the character of training, the first consideration should of course be ultimate service to the patient who will be treated by the practitioner. If the accepted course of training of dentists as at present carried out is inadequate to prepare the dental practitioner to render adequate service, that course of training should be modified. . . .
>
> Dentistry is a very specialized field of medicine which has already been elevated to a standard of professional excellence entirely comparable with that of other medical specialties. The average American dentist is at least as well qualified to render adequate service in his field of work as is the average otolaryngologist, ophthalmologist or surgeon. Dental education in America has been notably effective, and that is to the credit of the profession.

No exception can be taken to this analysis of the status of dentistry as related to medicine. The concluding statements, however, are not well-founded. I know the dental schools of this country, and they by no means turn out graduates of the calibre indicated. They are not—with, of course, some exceptions—on a par with the medical schools; nor are their students as carefully selected and as well prepared as medical students. Bland N. Pippin, D. M. D., of Washington University Dental School, to whom this letter was addressed later spoke on this question as follows:[2]

> Is it reasonable to expect (he asked) that medicine and the public will regard dentistry equal in health service to a recognized specialty of medicine, when there is such a vast difference in the character of pre-professional as well as of professional training? . . .
>
> Has the time not yet arrived when the leading representatives of medicine should meet with the leading representatives of dentistry and together agree upon a common plan of education, whereby dentistry could take its rightful place along with other recognized specialties of medicine? . . .
>
> The medical profession cannot always ignore the science of dentistry as being necessary in its teaching, but sooner or later it must embrace it. When that time comes, dentistry must not permit the mistake to be made that exists in Europe, where the necessary mechanical sciences have been largely disregarded. The mechanics in dental surgery that has to do with the vital tissues is as dignified and necessary as the mechanics in any other specialty of surgery. If the mechanics of dentistry is abhorrent to the medical mind, he must learn more about it to remove his prejudice.
>
> The attempts to teach dentistry according to different plans should no longer be defended on the ground that dentistry is in a transitional stage. The time has arrived when the authorities in the dental educational institutions should agree upon a common plan that looks to advancement as rapidly as possible to a standard where medicine can embrace it.

I believe, perhaps, the fundamental difficulty with medical educators in

2. "Future Dental Education," published in the *Proceedings of the Eighth Annual Meeting of the American Association of Dental Schools*, held in Memphis, Tenn., March, 1931.

discussing dentistry is their failure, often, to realize the very low quality of most practicing dentists' education. I wrote recently in a paper for the First International Stomatological Congress in Budapest:[3]

> Much lip service has been given to the "university ideal," and some superficially convincing alignments with universities have been recorded. Yet several schools without support except from student fees and clinic fees are more prosperous than ever. The bona-fide university school, of course, is not wholly dependent on fees; and its educational program is based on sound scientific and pedagogic principles. In one large "university" school students receive no credit for any part—or all—of their course, in the fine medical school of the same university. The dean of the latter school wrote me, "The schools are as separate and distinct as though thousands of miles apart." In another large "university" school, dental students, after six years of higher education, receive one year of premedical credit in the medical school. This simple fact alone condemns the nature of the university affiliation. Fundamental sciences should all be taught in the medical school. Dental students should do equal work, and receive equal credit, with medical students. . . .

With the mouth and its adjacent tissues playing the vital part they do in the bodily economy, this is a situation for serious consideration. It touches almost every citizen sooner or later, as a rule, in no gentle manner. If, as Dr. van Beuren points out, the mouth is possibly the source or the gateway of the majority of human ailments, can medicine afford longer to neglect it? It was brought to my attention that in the *New York Times* of October 19, 1931, Dr. Charles H. Mayo cited the fact that twenty-three types of disease may be approached through oral diagnosis. If only 17 per cent of the medical schools of the country "give any formal instruction in diseases and disorders or deformities connected with the teeth," should not a rather radical change be contemplated? Certainly, the oral specialist, as much as any other, needs a medical education.

But most of the thinking men who urge the return of dentistry to medicine feel that it could not be done at once. As I told Dr. van Beuren, I believe dentistry should climb up on the band wagon as soon as it is fitted to do so, but not before. The dental student should enter on the same basis as any other future specialist. With this understood, it is consistent to ask that a specialist in so important a region have an adequate scientific preparation—that he earn his title of "doctor" like any bona-fide doctor.

Under present indications in dental education, he will not do this in the dental schools. For the very reason that medicine has remained a profession it seems to me almost incumbent on medical education to take the long view and plan for still another burden—but on its own terms. Readjustments will be necessary on both sides. Organized dentistry does not wish this; but that does not alter the fact that medicine, for its own sake and that of humanity, cannot neglect so important a part of the human body. It seems to me that Dr. van Beuren's argument that the medical student needs to know more odontology leads us eventually to about the same ground. Nor is this exactly an "appeal"; it is the logical consequence of a condition which has only recently

3. "Some Phases of Dental Education in the United States," by Alfred Owre. Presented for the I. Songres International de l' Association Stomatologique Internationale, Budapest, Sept. 2-7, 1931.

gained widespread recognition. It seems to me, too, that Dr. van Beuren and I agree essentially in our ideal requirements. Last spring I stated before the American Stomatological Association:[4]

> If the dentist of the future is to be a professional man in any true sense, he must have the medical point of view, and the essentials of a medical training. The diagnostician of mouth conditions, who should be responsible for treatment, by whomever performed, needs a scientific and clinical foundation equivalent to that of any other specialist. It will not be the same, clearly, in all respects. This is not important. Neither is the title he should have. These are details. The important thing is a recognition of the principle, and insistence on the quality of the training. There should be experimentation with a curriculum based on these two foundation stones. . . .

The theory is gaining ground abroad. I have just learned that the inspector of dentistry in Sweden has recently made a recommendation to the Crown, to which he owes his appointment, that no one shall be allowed to practice dentistry in Sweden without the degree of "Medicin Doktor." And while we are on the subject, I think it fair to add, in regard to the Russian situation, that "a high school graduate" in Russia is—or at least always has been—a much better prepared person than any in this country. I have known a few myself. One hears quite conflicting reports of what Russian medicine consists today. Doubtless, it has much to learn, and many changes to undergo; but what it will do, I feel, is of significance. As President Butler remarked in regard to the general situation there: "They at least have a plan." My colleague at Columbia, Dean J. W. Barker of the School of Engineering, stated in his recent report to the President:[5]

> It is highly desirable that we should continually keep our pedagogical methods flexible to meet the changes in conditions which arise. Particularly is this true at the present time when our western civilization is approaching one of the most important crossroads in history, a crossroad where it is to come into more or less violent conflict with another civilization rising in the East and founded upon a radically different thesis.

Perhaps, these facts constitute less of a threat than a warning. Is it not possible to be too "carefully conservative in our thinking?" And this note is sounded increasingly loudly and often. *The Nation* recently made the following statement:[6]

> State control of medicine came in for a generous share of dispraise at the recent congress of the American College of Surgeons in New York City. Dr. C. Jeff Miller, retiring president of the organization, in the opening address discussed the much-mooted question of the cost of medical care. He enumerated the various alternatives to the unorganized individualism now prevailing in the profession: group medicine, in which a group of specialists undertake, for a fixed annual fee, to give any care, including hospitalization, that a given patient may require; health insurance; the great public clinics like those maintained at Johns Hopkins and Cornell University; and state-controlled medicine. The clinics, according to Dr. Miller, destroyed the personal relation between doctor and patient; the health insurance smacked of paternalism; control by the state was, according to

4. "Possible Educational Solutions of the Social-Economic Problems of the Professions of Medicine and Dentistry," by Alfred Owre. Read at a meeting of the American Stomatological Association, Columbia University Club, New York City, April 14, 1931.
5. Cited in the *New York Times*, Nov. 2, 1931.
6. *The Nation*, Nov. 4, 1931, p. 477. "The Doctors Look at Medicine."

report, far from satisfactory in Russia, and was almost certain to put the profession at the mercy of politics and to develop an unscrupulous and incompetent personnel. Dr. Charles Mayo, in discussing state medicine, made the same point. . . .

President Angell of Yale, the only layman speaking, advanced this point of view very strongly at the Surgeons' conference:

> "Of one thing we can be sure (he said) and that is that in the long run, by hook or crook, society will command competent medical and nursing service, adequate in amount to meet the needs of everyone. If it cannot secure this as a result of measures voluntarily devised and perfected by the profession and its interested friends, it will look to other agencies, and notably to the government, to produce the desired results. With political methods and conditions what they are now in the United States, it is difficult to contemplate such a solution without the gravest misgivings."

In his statements that "Dentistry, as practised, is a narrow specialization of effort that does not induce close reasoning nor broad consideration, but leads rather to insistence on the importance of small details to the obscuration of deeper significance. It does not offer the same implications of wide interests that medicine does and, in consequence, it does not in general attract the same type of student," Dr. van Beuren reaches the crux of the question. It is this situation which a revised system of education and practice would remedy. The medically trained dentist—stomatologist, if you will—would have to be the same type as any other medical student; and his field, in its wider implications, would be quite as inspiring as the majority of medical specialties. With such trained technical assistants as they needed, such specialists could carry on a much more scientific dental practice, and a much more efficient one. They would help to raise dentistry in the public esteem and gain the respect they merited. Certainly, as Dr. van Beuren points out, "we are not justified in calling dentistry a specialty of medicine at present;" but I am convinced we should work toward the end of making it ultimately a bona fide branch.

I should like to emphasize that what Dr. van Beuren calls "dentistry's proposals," i.e., "that the medical course, as now generally arranged be so changed that the last two of its four years would be years of specialization," is, insofar as I am concerned, only suggestive. Nor is it really dentistry's suggestion. It is rather, I believe, the brain child of medical educators interested in a more efficient arrangement of the medical curriculum.[7] Like anything else new in education, it would, as Dr. van Beuren notes, involve legal changes; but this is not an insuperable barrier.

Dr. van Beuren admits his nervousness over the prospect of a "subdentist" at work in his mouth with only from six months to two years of training. Ironically enough, most dentists who today work on the mouth have had only a high school education or less, with from three to four years of usually very diffuse, often inexpert, technical training in wholly inadequate schools. That is why he is forced to send so great a proportion of his work (it is estimated by one man who ought to know as from 60 to 90 per cent) to the dental laboratory—where it is done by technicians often with less than "from six months to

7. See "An M. D. Degree Five Years After High School," by Wilbur C. Davison, Dean, Duke University Medical School.

two years" training! And that training is got here or there or anywhere. It would be far safer and more satisfactory to have it acquired under our direction.

A recent survey of the dental facilities of one county showed, perhaps, typical conditions. Of the nine dentists in the county, five have had a three-year dental course, two a four-year course, and two a two-year course. The schooling of four had been completed thirty years or more prior to the survey. Only one dentist had done any postgraduate work. None of them had ever belonged to a study club. There is no county dental society. All are members of the American Dental Association. A large proportion of the laboratory work is sent out to commercial firms. Equipment, judging by investments reported, is meager. Little use is made of the X-ray—a service that is absolutely fundamental to scientific dental treatment.

Some pertinent comments on the whole question were brought out in the discussion of the paper I cited from, "Possible Educational Solutions of the Social-Economic Problems of the Professions of Medicine and Dentistry." Dr. Harold J. Leonard remarked:

> It seems to me the idea of having dentistry and medicine on varying levels is something of a bugaboo—more than it needs to be. . . . Some years ago I had the opportunity of starting a clinic in a university—a dental clinic in which I had to select about a dozen practitioners to do various types of dental work. I was responsible for the grade of work that went on in that institution. Although I personally could not have performed many of the pieces of work as well as they were done by the men under me—because I wasn't doing that type of technical work—I was able to tell whether they were doing creditable work from both mechanical and biological standpoints. It seems to me that it is not absolutely necessary that the man who is responsible for the work must himself be better trained in all the technical work than the men who would work under him.
>
> Another bugaboo is the idea that if we had varying levels, that is, if we had men trained to do the very fine scientific and health-service work with men working under them who could do the technical things, the latter would be likely to seek legislation which would give them an independent status. This liability, it seems to me, exists only where the technical men feel that they are being "gypped" in some way. At present a large number of laboratory men do nine-tenths of the laboratory work for certain practitioners. They are getting out of this work about a tenth of the actual fees that are being paid. They feel that it is unfair that the dentist should take the impressions—and not very good impressions at that—and that they, the laboratory men, doing the actual work in the case, should get perhaps only a tenth of the actual fee that is paid for the case. Feeling unjustly treated, they are looking for legislative relief.
>
> In the hospitals there are all kinds of technicians—men and women who are working happily in their various technical branches—but there is no thought there that they are going to the legislature and demand independent status so that they can go out and do independent Wassermans or blood counts or anything else without any relationship to the physicians. It seems to me a similar situation could be developed gradually in dentistry. It could not come all at once; it would have to be a gradual development.

It was stated by John L. Kelly, D. M. D., that "many fifty-cent (dental) students are burdened with a ten-thousand dollar education."

Dr. Moses Diamond commented:

> There are a number of ways of approaching the treatment of disease. One method, of course, is to attempt to treat merely symptoms of disease, which is an empiric method of approach. Another method is an attempt to find the causes of the symptoms. That analogy can very well be used in our present discussion of the social-economic conditions. One method is palliative. It attempts merely to treat symptoms. While that may do for a certain convenient period of time, yet it by no means gets to the root of the difficulty. The causative factors, which have been very clearly presented by Dean Owre, lie in basic education. . . .
>
> Just what the practical outcome of the ideas of Dean Owre will be relative to the eventual practice of dentistry is not very important at present. The real issue is the basic problem involved; and that issue, I feel with Dean Owre, rests in the field of education. The practical details will eventually take care of themselves as the basic ideas are more widely appreciated.

In the concluding discussion I stated:

> I don't suppose anybody could now give a complete program for this reorganized dentistry. It would be a foolish attempt, as Dr. Blum pointed out. But we can at least make a beginning. As I said at the Academy of Dentistry a few days ago, even so wise a man as Plato probably would modify his ideal state after it was set up and in going order. He would find it would not work here and there. It almost requires the philosophy of Heraclitus to get ahead at all in this world. You remember Heraclitus was the philosopher who believed in change. . . .

Within a month I have had a number of stimulating (unsolicited) letters on this subject. One man writes:

> I cannot pretend to be familiar with the details of the many problems of dental and medical education, but it does not require such detailed knowledge to recognize the force of certain arguments which you have put forth. Some time ago I consulted a dentist of unusual ability who did work for me, requiring skill, and I have no cause to complain of the cost of his work, but it is obviously preposterous that he should spend his time in doing work which could be done quite as well by a young man with less than one-fourth of his education and experience, and it is manifestly wrong that I should be called upon to pay such rates for work which could be done quite as well, under his supervision, at a far lower cost. I will even say that I resent having to pay a dentist of slight education and attainments as much for two hours' work as I receive for an entire day, although I have been the head of a department in ..... Medical College for twenty-five years. . . .
>
> I sincerely hope that the leaders in dentistry will come to recognize the necessity of having assistants under the supervision of masters, because there are undoubtedly many persons who, like myself, resent paying fifteen to twenty-five dollars an hour to young men of meager education and of no extraordinary ability, and who would visit the dentist more frequently than they do if the charges were less.

It is well known that certain treatments required in what are properly various fields of medicine can be given better by the trained technician or artisan than by the physician himself. Optical refraction is a case in point. As the majority of dentists are now educated they are fitted only for technical procedures no more exacting than those of optometry. They are not competent to deal with pathologic conditions.

From my long experience in private practice, in clinics, and as an educator, I am convinced that a parallel development in dentistry to that in ophthalmology is entirely feasible. A technician can as well be trained to make impressions, for instance (a prerogative dentistry hugs to its heart), and better ones than most dentists make, as an optometrist can be trained to do refracting. Diagnosis of oral conditions and prescription for treatment should be permitted only to the medically educated specialist. Moreover, why should six or seven years be spent to learn anything but a bona fide profession? And why should highly educated specialists spend their valuable time doing merely technical work? Dentistry, even more than ophthalmology, is a field in which a reorganized scheme of practice along the lines indicated would result in very great economy to the public, and in a much needed definition of function to both practitioner and technician. And the economics of the situation is an increasingly powerful factor. I think we would do well to emulate the example of Yale University, which, to quote from the last report of Dean Winternitz,

> . . . aims gradually to incorporate in medical education at Yale the teaching of dentistry from the viewpoint of the interrelationship of the teeth and the rest of the organism in health and disease. It aims further so to correlate teaching, investigation, and practice, in regard to the teeth, with the other activities of the educational and service units of the School of Medicine and affiliated institutions, that, at Yale, at least, dentistry will become as significant a branch of medicine as any other specialty.

JOURNAL
OF THE
Association of American Medical Colleges

Volume 7 MAY, 1932 Number 3

DR. FRED C. ZAPFFE, Editor, 5 South Wabash Ave., Chicago.

National Board of Medical Examiners

At a meeting of the Executive Committee of this Board held in Chicago, February 14, Dr. A. Graeme Mitchell, professor of pediatrics in the University of Cincinnati College of Medicine, was elected to membership as the second representative of the Association of American Medical Colleges. The other representative is Dr. A. S. Begg.

Dr. Mitchell succeeds the late Dr. J. Whittridge Williams who was also accredited to this Association as its representative.

Forged Credentials

It is not an infrequent experience of deans of medical schools and state medical examiners to meet the need of passing on credentials which later are proved to be forgeries. Several such instances have been reported recently to the Association by deans. But it remained for a licensing body to take a step which will, no doubt, prove a check to those who may feel the urge to gain desired recognition by such means.

In New York a man was recently sentenced to the penitentiary for an indeterminate period for making use of forged credentials, including a forged diploma of graduation, purporting to have been issued by Johns Hopkins University, to secure a license to practice. Credit for this conviction goes to the energetic attorney general of the State of New York, Mr. Sol Ullman.

Very recently an applicant for admission to a medical school in England presented credentials from an American medical school which showed that he had completed the first two years of the medical course with much credit to himself. On inquiry the medical school in question denied ever having had this man in attendance, although a man of the same name (but not the same initials) had graduated from the school several years before the more recent applicant claimed to have been in attendance.

All cases of forged credentials should be reported to the Association in order that later attempts to make use of these same credentials may be checked.

Study of Student Accomplishment

The study of the records made by students who entered medical schools in the fall of 1930 is completed. The data obtained from this study were mailed recently to every medical school in membership in the Association. They will, no doubt, prove extremely interesting. This is the first time that such an extensive study has been made. Of particular interest is that part of the study which shows the relationship of the extent of premedical education to accomplishment in medical school.

Chemistry Requirements

The American Chemical Society, at its annual meeting held recently in New Orleans, received a report from a committee appointed to study the premedical requirements for chemistry. This committee made contact with all the medical schools, as well as with the schools of liberal arts and sciences, and concluded that the desirable minimum requirements for chemistry should be as follows:

General Inorganic Chemistry: Eight semester hours, of which half the credit shall be in laboratory work, including qualitative analysis. Organic Chemistry: Six semester hours, provided the work includes both aliphatic and aromatic divisions, but eight hours are to be preferred. Of the credit hours required, from one-fourth to one-half shall be in laboratory work. Quantitative Analysis: Three semester hours, of which two semester hours shall be in laboratory work.

The present requirement in chemistry of this Association is eight hours of general chemistry, including a minimum of four semester hours of laboratory work, qualitative analysis may be included as a part of this requirement, and four semester hours of organic chemistry, consisting of didactic exercises, which should cover a discussion of the aliphatic, carbocyclic and heterocyclic series. It is recommended that additional work be offered in organic chemistry and that this additional work include a fair proportion of laboratory work.

Urusvati, Himalayan Research Institute of Roerich Museum

Foremost among institutions pursuing biological and medical research among peoples of the ancient Orient is Urusvati, Himalayan Research Institute of Roerich Museum, whose thoroughly modern laboratory building is nearing completion at Naggar, Kulu, India, on the slopes of the Western Himalayas.

Professor and Mme. Roerich have already donated the necessary land and headquarters building; and a permanent structure designed to meet the preliminary requirements of a proposed new Biochemical laboratory, now nears completion, its cost being covered by a special gift already provided for that purpose.

Vital work in the study of native works on Tibetan medicine has begun, and a remarkable collection of ancient medical books has been made. Thousands of specimens of local plants of medicinal promise, and of local fauna of scientific interest, have been collected.

So eloquent are the possibilities indicated by the first three years of achievement, and so imperative the need for further funds to carry on those portions of the work deemed of utmost significance, that a campaign for a fund of $200,000 for its support is now inaugurated by Roerich Museum through its Committee for the Biochemical Laboratory Fund.

With the sums raised, it is planned to build and equip additional laboratories and new buildings for physical, pharmacological, cancer research, and other like purposes; to erect an electrical plant at the Institute; to add additional scientists to the staff; to collect and investigate Eastern medical lore; and in all ways that may be available to further the researches at Urusvati, designed to aid the well-being of humanity through advancing human knowledge.

Contributions to this fund are solicited. They should be made payable to "Roerich Museum, Biochemical Laboratory Fund," and should be forwarded to the Museum, 310 Riverside Drive, New York City, New York.

Research

Research laboratories dedicated to carrying on fundamental research of high order gloriously serve the advancement of mankind through their investigations and discoveries. When so directed that the atmosphere of independent achievement is allowed to spread into the haunts of upperclass students, as well as to graduate students and teaching staff, they culturally make large contributions to educational results, and, thus, their value to civilization is multiplied.—*Science*, Aug. 21, 1931.

College News

Cornell University Medical College

As soon as the present term ends in June, the college will move into its new quarters in the New York Hospital Medical Center. The fall term will open there September 29. This new medical center covers three square blocks along the East River between Sixty-eighth and Seventy-first Streets.

University of Cincinnati College of Medicine

Faculty changes: Promotions: Frank M. Coppock, to associate professor of gynecology; John R. Stark and V. B. Roberts to assistant professor of gynecology; Joseph Heiman and Mabel Gardner to instructor in gynecology; Ralph W. Staley, Ernest O. Swartz and Henry B. Freiberg were appointed assistant professors in the department of urology. Maurice Lynch was appointed research associate in physchiatry and will receive one of the Stern scholarships effective July 1.

Harvard Medical School

Mrs. Francis Glessner Lee, of Littleton, N. H. founded a new chair of legal medicine which will support a resident professor of legal medicine and provide for one or more lectures by visitors each year. Dr. George B. Magrath has been appointed the first holder of the new chair.

A provision of the gift provides a plan to accumulate in the medical school a file of cases on the subject.

A six weeks course in internal medicine for graduates, beginning June 20, is announced. It will consist of a review of the diagnosis and treatment of problems most commonly encountered by medical pratitioners and internists.

University of Utah School of Medicine

L. L. Daines, professor of pathology, has been appointed acting dean.

University of Maryland School of Medicine

Plans for the new University Hospital, to cost $1,500,000, are completed—the funds having been voted at the last session of the general assembly. The plans call for a 400 bed hospital in the shape of a cross. The building will be erected either on the site of the present hospital or in the vicinity of the other university buildings. It will be twelve or thirteen stories high. One half the total number of beds will be teaching beds; the remainder will be available to persons of moderate means.

Ohio State University College of Medicine

Dr. Esmond R. Long, professor of pathology, University of Chicago, delivered the annual lectures in pathology at the Ohio State University College of Medicine, February 26. The first lecture was given before the faculty and student body on "A Survey of the Origins of Modern Pathology" and the second to the faculty, the students and the medical profession of Columbus on "The Exudative Phenomena in Tuberculosis."

Woman's Medical College of Pennsylvania

An open scientific meeting was held at the college building, March 11, marking the eighty-second anniversary of its

founding. Dr. Edward B. Meigs, Washington, D. C., was the speaker of the evening. His subject was "The Nutritive Value of Milk."

University of Toronto Faculty of Medicine

Jabez Henry Elliott has been appointed professor of the history of medicine to succeed John T. Fotheringham, who retired in June, 1931. For the past six years Dr. Elliott has been a special lecturer in medicine at the university.

A scroll of recognition was recently presented to Dr. Velyien Ewart Henderson, professor of pharmacy and pharmacology by the International Anesthesia Research Society in appreciation of his work in anesthesia.

The sixth annual Donald C. Balfour Lecture in surgery was delivered April 5, by Dr. Rudolph Matas, emeritus professor of surgery, Tulane University of Louisiana, New Orleans. His subject was "The Story of Postoperative Pulmonary Embolism, before and after Lister."

Tufts College Medical School

A course in "Human Relations" is now in progress under the direction of Miss Elizabeth P. Rice, Director of Social Service at the Boston Dispensary. The course will consist of six lectures for the first-year class at weekly intervals, following which twenty members of the class will be selected for field study at the dispensary. The importance in medical treatment of environmental factors is emphasized.

There will be no discussion of disease entities, but rather the attempt will be made to give the student some concept of the human being, the subject of his study, from the standpoint of the social factors which influence his daily life. The aim will be to encourage the student to maintain an open mind with respect to the human being he is studying in order that he will not lose himself entirely in the search for disease.

An introduction to the field practice of social service will be offered at the close of the courses of lectures. Each of the twenty students who will be assigned to this work at the Boston Dispensary will have an opportunity to visit particular cases and gain some insight as to the methods, problems, and purposes of practical social work. The method of approach to individuals in need and the accumulation of necessary data with respect to the problem involved will be indicated.

During the past two years Miss Rice has met in conference groups the members of the senior class at Tufts Medical School during the required month on District Medicine at the Boston Dispensary will have an opportunity to visit particular cases and gain some insight as to the methods, problems, and purposes of practical social work. The method of approach to individuals in need and the accumulation of necessary data with respect to the problem involved will be indicated.

During the past two years Miss Rice has met in conference groups the members of the senior class at Tufts Medical School during the required month on District Medicine at the Boston Dispensary. Thus, the first and the fourth-year classes are both receiving some instruction in the social factors in medicine.

University of Pittsburgh

The Falk Clinic, construction of which is completed, embodies many of the latest features both for teaching and for the care of the sick. It will serve as a general dispensary for the Medical Center in Pittsburgh. The plan includes arrangements for medicine and surgery and the specialties, and is large enough to accommodate 500 outpatients a day. The

greater part of the teaching in medicine will eventually be centered here. The clinic was given to the University by the Falk brothers of Pittsburgh. Dr. Joseph Barach is the medical director.

Detroit College of Medicine and Surgery

A chair of internal medicine is to be established by the will of Dr. James Cleland, Jr. The bequest becomes effective after the death of Dr. Cleland's wife.

Washington University School of Medicine

An intensive four weeks course in obstetrics and gynecology for graduates is offered. The next course begins May 2. Dr. Otto H. Schwarz is in charge of the course.

Saint Louis University School of Medicine

At a student seminar held recently, papers were presented on the "Clinical Importance of the Reticulo-endothelial System" and on the "Life of Lister," followed by an open discussion. This activity is fostered by the local Beta Chapter of Alpha Omega Alpha and is conducted wholly by the students and on their own initiative. The topics chosen are such as to be of benefit to the students in their clinical work as well as in the fundamental sciences, and also include biographic treatises of past leaders in medicine.

A highly interesting innovation in student routine is the Student Journal Club in Internal Medicine recently inaugurated at the school of medicine. The club is the idea of Dr. Ralph Kinsella, director of the department of internal medicine, and includes as its members those externs assigned to his clinic at St. Mary's Hospital. Its objective is to stimulate the interest of the students in current articles on internal and experimental medicine. Each student is assigned a subject in current literature, which he reviews and reports to the club. Discussions follow the presentation.

Marquette University School of Medicine

A Graduates' Bureau was inaugurated recently which has been instrumental in giving to the members of the senior class information of value for future competence. Each student receives a letter offering the following aid: (1) Information on open locations for doctors; (2) information on physicians' equipment, offices, etc.; (3) information on residencies in hospitals; (4) fellowships: in clinics, research, National Research Council; (5) openings at Marquette in the basic science departments, for some who have aptitude for research and teaching.

University of California Medical School

Summer courses for graduates in medicine will be offered June 6-18, 1932. Several clinical branches will be given in the morning and afternoon courses. The following subjects are to be offered: general medicine, general surgery, ophthalmology, otorhinolaryngology, genito-urinary diseases, pediatrics, circulatory diseases, diseases of the blood forming organs, diseases of the endocrine glands, including diabetes, and diseases of the gastro-intestinal tract, laboratory diagnosis, pathology, and operative technic.

In addition to the regular courses, there will be symposia of the departments of medicine and surgery at 9 o'clock on Wednesday mornings, daily noon lectures and clinico-pathological conferences and round table discussions on various subjects on three evenings each week. The symposia, lectures, conferences and

round table discussions will be open to the medical public without charge.

The announcement of courses will be ready about May 1, 1932, and will be mailed on request made to the dean's office, University of California Medical School, Parnassus and Third Avenues, San Francisco, California.

Dr. J. Homer Woolsey is in charge of summer graduate courses.

The university lecturer in the medical school for 1932-1933 will be Dr. W. McKim Marriott, dean and professor of pediatrics at Washington University School of Medicine, St. Louis. Dr. Marriott will be at the medical school early in the fall of 1932. He will conduct lectures and clinics similar to those conducted by other university lecturers.

Dr. Linn J. Boyd, professor of medicine at New York Homeopathic Medical College, will talk to students in the University of California Medical School during April, 1932. His talks will cover the following subjects: (1) The Contributions of Homeopathy to Clinical Pharmacology during the Last Five Years. (2) The Pharmacologic Basis of Homeopathy.

University of Virginia Department of Medicine

Dr. D. C. Smith spoke before the Rockingham County Medical Society in Harrisonburg, February 8, on "Classification of Skin Diseases."

At the meeting of the University of Virginia Medical Society, held February 22, Dr. Hugh Trout, surgeon in chief, Jefferson Hospital, Roanoke, Virginia, spoke on the subject "The Release of Pericardial Adhesions." February 19, Dr. C. C. Speidel gave an account of his studies of living nerve fibers before the students in biology at Lafayette College, Easton, Pennsylvania. Dr. H. B. Mulholland spoke before the Warwick County Medical Society, meeting in Newport News, February 22, on "Recent Advances in the Study of Diseases of the Blood." March 7, Dr. Kenneth Maxcy spoke on "Recent Studies in the Typhus-like Fevers" and Dr. E. C. Drash spoke on "Closed Internal Pneumolysis." March 14, Dr. George R. Minot, professor of medicine at Harvard Medical School, addressed the faculty and students on "The Treatment of Anemias." March 26, Dr. H. E. Jordan attended the annual meeting of the Executive Committee of the Commission on Standardization of Biological Stains at the Medical Center, Columbia University.

New York University and Bellevue Hospital Medical College

Faculty changes: Promotions—Frank C. Combes, Jr., to assistant clinical professor of dermatology and syphilology; Henry C. Falk to clinical professor of gynecology; Onslow A. Gordon, Jr., to associate professor of gynecology; Francis W. Sovak, to clinical professor of gynecology.

University of South Dakota School of Medicine

This institution has been presented with the medical library of the late Dr. Frank A. Swezey. It comprises several hundred volumes, pamphlets and notebooks.

Jefferson Medical College

The Curtis Clinic, the new outpatient department of Jefferson, has been completed at a cost of about $1,600,000 and has been in use since the beginning of the present college year.

March 4, the Alpha of Pennsylvania Chapter of Alpha Omega Alpha presented as guest lecturer Lewellys F. Barker, emeritus professor of medicine, Johns Hopkins University. The subject of his lecture was "Medical and Other Conditions in Soviet Russia." March 10,

the J. Earl Thomas Physiology Society presented as guest lecturer R. L. Stehle, professor of pharmacology, McGill University. The subject of his lecture was "Some Vascular and Cardiac Actions of Pituitary Extract." March 16, the Elmer H. Funk Therapeutic Society presented as guest lecturer Charles M. Gruber, associate professor of pharmacology, Washington University, St. Louis. The subject of his lecture was "The Action of Drugs on the Gastro-Intestinal Tract."

University of Pennsylvania

The university has announced a bequest of $2,500,000 for the erection of a hospital and an equal amount for endowment from the late Frederic S. Pepper, Jr. It is to be a part of the University of Pennsylvania Hospital and will be for the free care and treatment of sick and injured persons.

Albany Medical College

Noon-day clinics are being held throughout the present college year. Various departments of medicine are represented. Any practising physician may attend.

Temple University

The annual Founder's Day Exercises were held February 15. Honorary degrees were conferred on Anne Sullivan Macy, teacher and life-long friend of Helen Keller, who also attended the exercises, Dr. James N. Rule, superintendent of the Department of Public Instruction of the Commonwealth of Pennsylvania and Robert S. Frazer, chief justice of the Supreme Court of Pennsylvania. Degrees were also conferred on 285 students of the University.

Faculty changes: Lowrain E. McCrea was advanced from demonstrator to associate in genito-urinary surgery; J. Merriman Lynch and Nathaniel Hurwitz were appointed clinical assistants in medicine; George D. Mulligan, clinical assistant in rhino-laryngology; Joseph A. Parrish, clincial assistant in surgical research; and Joseph Weiner was advanced from clinical assistant to instructor in medicine.

A department of medical illustration has recently been established. William Brown McNett, medical artist and illustrator, who received his training at Johns Hopkins University, Baltimore, has been appointed director. Two courses will be offered, one for artists and art students with the necessary qualifications and the other for medical students and graduates, teachers and research workers who wish a knowledge of the graphic arts.

Duke University School of Medicine

February 13, Dr. Fred H. Albee, of the Post Graduate Medical School, New York City, lectured on "Fractures of the Hip-Joint." February 18, Dr. M. Pierce Rucker, of the Medical College of Virginia, gave a clinic on "Eclampsia."

February 24, 25 and 26 the National Board examinations were given to fifty of the Duke medical students.

New York Homeopathic Medical College

Dr. Helen C. Coombs of the Department of Physiology of the New York Homeopathic Medical College has received a grant of $575 from the Committee on Scientific Research of the American Medical Association for the study of blood changes in experimental epilepsy.

Dr. Israel S. Kleiner, Professor of Physiological Chemistry of the New York Homeopathic Medical College, has received a grant of $500 from the Committee on Scientific Research of the American Medical Association for a continuation of his and Dr. Henry Tauber's studies on enzymes.

Through the will of the late Dr. Lester E. Walker of Norwich, Connecticut, the New York Homeopathic Medical College and Flower Hospital has received a legacy of $1,000 for the general purposes of the institution.

Through the will of Mrs. Mary H. Mitchell of New York City, $5,000 has been received by the New York Homeopathic Medical College and Flower Hospital for general purposes.

Emory University School of Medicine

John J. Morton, professor of surgery in the University of Rochester School of Medicine, served as professor of surgery pro tempore in the place of Dr. Daniel C. Elkin, the week of Jan. 25 to 30, 1932.

Medical College of Virginia

The college library now contains 14,850 bound volumes and 3,000 pamphlets and 360 medical periodicals are received regularly. Dr. E. B. C. Miller is the librarian. It is expected that the library will be moved into the new library building before the opening of the next session.

In order to meet the increased cost of conducting the outpatient department, more than 5,000 visits a month now being made, the Richmond Community Fund recently appropriated $1,700 as an emergency measure.

Dr. Robert Bryan, at his request, has been retired from the professorship in genito-urinary diseases and was elected professor emeritus.

The Richmond Kiwanis Club has continued its appropriation of $1,800 for the work of the orthopedic clinic of the outpatient department for 1932.

The third annual Stuart McGuire lecture was delivered March 4 by Dr. James S. McLester, Birmingham, Alabama.

Creighton University College of Medicine

Twenty students have formed a Medical History Club. The purpose of the club is to assist the members in acquiring more of the cultural background of medicine.

Membership in the organization is limited to students interested in the historical and general cultural phases of medicine. The charter members of the organization believe that these studies will give them a deeper appreciation of their profession and enable them to profit by the trials and work of their predecessors. From time to time outside speakers will be invited to address the club.

Dr. Charles M. Wilhelmj, professor of physiology, was the stimulus in the founding of the club.

Personals

Dudley A. Robnett has been appointed associate professor of surgery in the School of Medicine of the University of Missouri. He has been a member of the department of pathology.

Lafayette B. Mendel, for many years Sterling professor of physiologic chemistry in Yale University School of Medicine, was recently presented with a portrait of himself on the occasion of his sixtieth birthday.

An honorary fellowship of the Ross Institute for Tropical Diseases, London, has been conferred on Dr. C. C. Bass, dean and professor of experimental medicine in Tulane University of Louisiana School of Medicine in recognition of his important discoveries in malaria with special reference to his accomplishment of the first successful cultivation of the malaria parasite outside the human body.

Dr. Aldo Castellani, London, has been appointed professor of tropical medicine in the Louisiana State University Medical Center for the year 1932-1933.

Dr. Henry E. Sigerist, professor of the history of medicine and director of the Institute of the History of Medicine in the University of Leipzig, has been appointed visiting lecturer in the Johns Hopkins University School of Medicine for the present year.

Dr. Esmond R. Long, professor of pathology in the Graduate School of Medicine of the division of biological sciences in the University of Chicago, has resigned to become the director of laboratories of the Phipps Institute of the University of Pennsylvania.

Dr. Maurice H. Rees, dean of the School of Medicine of the University of Colorado, was recently elected president of the Denver Public Health Council.

Dr. Hilding Berglund has resigned as professor of medicine in the University of Minnesota Medical School, effective June 30, 1933. He will spend the year beginning June 30, 1932, in absentia.

Dr. Jesse F. McClendon, professor of physiological chemistry in the University of Minnesota Medical School, has been appointed visiting professor at the Tohoku Imperial University, Sendai, Japan, under the Rockefeller Foundation.

Dr. Augustus Thorndike, Jr., Boston, has been appointed surgeon in the department of hygiene, Harvard University Medical School; he will also direct the medical activities in athletics. Dr. Thorndike will succeed Dr. Thomas K. Richards, whose resignation will become effective in the fall.

Robert B. Cofield has resigned as professor of orthopedic surgery in the College of Medicine, University of Cincinnati.

Catharine MacFarlane, head of the department of gynecology in the Woman's Medical College of Pennsylvania, is the first woman to be elected a Fellow of the Philadelphia College of Physicians.

Malvern B. Clopton, professor of clinical surgery in Washington University Medical School, was recently elected president of the corporation of Washington University. In June, 1930, Dr. Clopton gave $250,000 toward the construc-

tion and equipment of the Rand-Johnson Memorial Wing of Barnes Hospital, and in March, 1931, he gave a collection of valuable art prints to the university's projected museum.

Harry B. van Dyke, professor of pharmacology, University of Chicago, has been appointed professor and head of the department of pharmacology at Peiping Union Medical College, Peiping, China, effective about August 1.

George C. Shattuck, assistant professor of tropical medicine in Harvard Medical School, has gone to Puerto Barrios, Guatamala, to carry on research under the auspices of the Carnegie Institution. He is accompanied by John L. Bremer, Hersey professor of anatomy.

The March issue of the *Yale Journal of Biology and Medicine* is dedicated to Lafayette B. Mendel, professor of physiological chemistry at Yale University. It is named "The Mendel Anniversary Number," in recognition of the sixtieth anniversary of his birth.

George P. Berry, of the Rockefeller Institute for Medical Research, has been appointed professor of bacteriology and assistant professor of medicine in the University of Rochester School of Medicine and Dentistry.

Frank A. Hartman, professor of physiology in the Department of Medicine of the University of Buffalo, was awarded the Chancellor's Medal, the award of the University for public service.

Solomon Rosokoff and Wilson D. Langley of the department of biochemistry in the Department of Medicine of the University of Buffalo, have received a grant from the American Medical Association to be used in the study of ketosis.

Victor C. Jacobsen, professor of pathology, Albany Medical College, has been awarded a grant of $1,000 by the American Medical Association to aid in a study of transplantable mouse melanoma.

John C. Donaldson, associate professor of anatomy in the School of Medicine in the University of Pittsburgh, was promoted to professor of anatomy.

M. Bodansky, professor of pathological chemistry in the University of Texas School of Medicine, will be visiting professor of biological chemistry at the American University of Beirut, Syria, this fall.

Alfred N. Richards, professor of pharmacology in the School of Medicine of the University of Pennsylvania, was awarded the William Wood Gerhard Gold Medal of the Pathological Society of Philadelphia.

Philip B. Hadley, associate professor of bacteriology in the University of Michigan Medical School, delivered the eighth Ludwig Hektoen lecture of the Frank Billings Foundation of the Chicago City Club.

A. C. Ivy, head of the department of physiology and pharmacology in Northwestern University Medical School, delivered the fifth Harvey Society lecture before the New York Academy of Medicine.

Gordon Ritchie, assistant professor of pathology in the University of Michigan Medical School, has been granted a leave of absence.

General News

Herbert Celler Foundation

This Foundation will shortly award a fellowship carrying an annuity of $750 for the year beginning July 1.

Each candidate must submit with his application a personal record, a list of his publications, if any, an outline of the work he wishes to pursue and suitable recommendations. This information is to be sent to the secretary, Dr. Benjamin Eliasoph, 941 Park Avenue, New York. The Herbert Celler Foundation was organized to perpetuate the memory of Dr. Herbert L. Celler, who, until his death about four years ago, was associate attending physician at Mount Sinai Hospital. The money was obtained by voluntary contributions from lay and medical friends of Dr. Celler, the income from which was to be awarded to a suitable candidate to pursue further study or research either in the United States or abroad.

University of Cincinnati

The president of the university, Herman Schneider, has resigned. He will be succeeded by Dr. Raymond Walters, dean of Swarthmore College on September 1.

Dr. Schneider will remain in the university as dean of the college of engineering and commerce and director of the institute of scientific research, each of which he established.

Thayer Lectureship in Medicine

The trustees of Johns Hopkins University announce that the fifth course of lectures under the William Sydney Thayer and Susan Read Thayer Lectureship in Clinical Medicine will be given by Dr. A. R. Dochez, professor of medicine in Columbia University College of Physicians and Surgeons. The subject of Dr. Dochez' lectures will be "A Limited Consideration of Certain Aspects of Acute Infection of the Respiratory Tract."

University of Missouri

The Jackson County (Missouri) Medical Society recently appointed a committee to act in the interest of procuring for Kansas City the last two years of medical instruction for students at the University of Missouri which were authorized in 1930.

William Snow Miller Lecture

Dr. Jay Arthur Myers, associate professor of preventive medicine and public health, University of Minnesota Graduate School of Medicine, Minneapolis, gave the fifth William Snow Miller Lecture under the auspices of the Phi Beta Pi fraternity and the University of Wisconsin Medical Society, in Madison, March 31, on "Recent Studies in Tuberculosis."

John Phillips Memorial Prize

Oswald T. Avery, of the Rockefeller Institute for Medical Research, is the recipient of the first prize, amounting to $15,000, which was established by the American College of Physicians in memory of Dr. John Phillips, who lost his life in the Cleveland Clinic disaster in May, 1929.

Benjamin Knox Rachford Lectures

The second annual series of these lectures was given April 22 and 23 at the University of Cincinnati College of Med-

icine by Dr. Bronson Crothers, assistant professor of pediatrics in Harvard Medical School. The topic of the first lecture was "The Relation of Medicine to Psychology and Education;" of the second, "Concerning Team Play in Child Guidance."

Vitamin A Clinical Research

Mead Johnson and Company, Evansville, Indiana, announce that they will award $15,000 to the investigator or group of investigators producing the most conclusive research on the vitamin A requirements of human beings. Candidates for the award must be physicians or biochemists, residents of the United States or Canada, and not connected with any commercial house. Manuscripts must be accepted for publication before December 31, 1934, by a recognized scientific journal. The investigation must be essentially clinical in character, although animal experimentation may be employed secondarily.

The committee on award has not yet been selected but will be chosen from among eminent authorities who have no connection with Mead Johnson and Company. The vitamin A needed for this study will be supplied in unlimited quantities by Mead Johnson and Company, from whom further details regarding this study may be secured.

Philadelphia Institute of Medical Research

Announcement is made of the establishment of an institute for medical research in Philadelphia, to begin work in the autumn under the direction of Dr. Leonard G. Rowntree, now director of clinical investigation, Mayo Clinic, Rochester, Minn., and professor of medicine, University of Minnesota.

The Philadelphia Institute for Medical Research will center its activities in the Philadelphia General Hospital and will attempt to foster research through affiliation and collaboration with all medical institutions in the city. It will afford a meeting place for all the medical school services at present affiliated with the hospital and will in addition hold itself ready to cooperate with any or all other institutions desirous of establishing a relationship. A site on the hospital grounds has been assigned for the erection of a building when funds become available, but in the beginning the institute will occupy temporary quarters in a new building now under construction and will function in conjunction with the hospital staffs. The new institute will be devoted to clinical investigation. Research will be made for methods of preventing disease, for improvements in methods of study, and of diagnosis and treatment, especially in the earlier stages. Studies will also be carried on in the fundamental branches of sciences underlying medical knowledge.

The creation of the Institute grew out of a centenary celebration of the birth of Pasteur in 1922 arranged by a group of Philadelphia physicians. Charter members of the institute were the late Dr. William Duffield Robinson, Admiral William C. Braisted, Dr. Judson Daland, the late Dr. Francis X. Dercum, Dr. McCluney Radcliffe, Provost Edgar Fahs Smith, Dr. Charles A. E. Codman, Mr. Hampton L. Carson and Mr. Joseph Carson. Dr. Daland is president.

New Cancer Relief Fund

The will of Dr. John Edmund MacKenty, former senior surgeon of the Manhattan Eye, Ear, Nose and Throat Hospital, who died on December 11th, provides $50,000 for a "MacKenty Fund," the income of which is to be used for educational propaganda on cancer of the larynx and to help defray expenses of charity patients operated on at the hospital for cancer.

Abstracts of Current Literature

"Lernfreiheit"

"Lernfreiheit" carries with it the corollary or insistence upon the value of private study. Every student is encouraged to cover a wide field of reading, to choose his text-books for himself, and to pursue his interests largely unhampered by set books and prescribed sources of information.

Examinations, in our sense of the word, are almost non-existent; emphasis is laid upon the presentation of a thesis followed by a rigorous oral test. A notable exception is the faculty of law where written papers form a part of the examination. No terminal tests of progress occur, though the passage to higher seminar grades is based upon the ability shown in the lower grades. In determining the assessment of ability, the professor may use his unfettered discretion; he is the autocrat of the seminar. Report of Commission of Investigation, Association of University Teachers: *The Universities Rev.*, Vol. iv, No. 1; *Bull. Am. Assoc. Univ. Prof.*, March, 1932.

Place of Preventive Medicine in Medical Curriculum

Report of the Committee appointed by the Council of the Society of Medical Officers of Health, London, England. (1) That in every medical school a scheme should be prepared showing how each department can cooperate in the teaching by the authorities of each medical school to put the scheme, when finally approved, into operation at the earliest possible moment. (2) That, if an adequate scheme of this nature is adopted, the number of lectures provided in the special course of instruction in public health and preventive medicine should be not less than twenty-four. (3) That the course should be given not earlier than the penultimate year of medical study. (4) That the syllabus outlined should be taken as a model by all special lecturers on public health and preventive medicine. (5) That medical officers of health should be invited to cooperate in the training of medical students by affording them facilities for becoming acquainted with certain branches of the public health work undertaken by local authorities. (6) That no student should be permitted to obtain a registerable medical qualification without having passed a separate examination in public health and preventive medicine. Such examination should include a written test of not less than five questions, and an oral test. This examination should, if possible, form part of the final qualifying examination. (7) That there should be included in the other subjects of the various professional examinations questions dealing with the appropriate aspects of preventive medicine. —Methods and Problems of Medical Education, Rockefeller Foundation, 1932.

Teaching of Pharmacology

At the outset it becomes difficult to say what is and what is not pharmacology. The subject is vast in its scope and intimately related to other subjects so that its isolation becomes difficult. If medical students must learn it, they do so supposedly to apply it, which raises at once the question not only of the type of course they should receive, but of whether or not the pharmacologist should step over into the domain of the therapist. There are very few courses as such offered in therapeutics. There are fewer departments of this very important

subject. The pharmacologists stop with an understanding of the actions of certain drugs on normal tissues. The students wonder why. There is a tremendous gap between the pharmacological laboratory and the clinic. The question of the scope of pharmacology at once brings forward for consideration not only the number and the character of the drugs which should be included, but also whether or not some light understanding of closely allied subjects such as materia medica and pharmacy should receive consideration. Any detailed study of these subjects should be eliminated, yet it would appear not amiss for the student to know something pertaining to them, especially in connection with a small number of important drugs such as digitalis, opium and nux vomica. Such information is not primarily useful, but an understanding of the origin and appearance of the important drugs he uses should give to the medical student more respect for himself, if not for the drug. Pharmacy needs but little space in a course in pharmacology. A short introductory course in this subject to include the technic of prescription writing can do several things. It informs him what to expect of his pharmacist and enables him to have at least some idea as to whether or not his prescription has been faithfully executed. If a physician knows how to write a simple prescription he is more than likely to turn to certain official and dependable drugs to incorporate in this mixture and to turn away from the ever increasing list of proprietary and incidental mixtures which are forced on him by advertising agencies and drug dispensers. After excluding as worthless or unnecessary many drugs, there yet remains a fairly large number of very valuable substances both organic and inorganic which should be included in a course in pharmacology. The student should know about them accurately. Just what amount of intricate scientific detail should be included in this course for medical students and how much should be eliminated in the brief time at the disposal of the pharmacologist? It is not in the least to be inferred that a mass of detail is not worth while. It is a question, however, whether or not some of the detail should be sacrificed to an understanding of certain principles which may involve the practical usage of the drugs. As an example, the student should know the composition of Ringer's solution and the principles upon which its conception depends, but is it necessary for him to be so physico-chemically minded that he can explain the delightful intricacies in the action of each constituent? Many teachers of pharmacology have so over-estimated and emphasized the purely scientific side of the subject that they have failed to interest the student and have built up in him as a clinician on account of his ignorance a disregard for many drugs of great value. In presenting a course in pharmacology a question of great interest and importance is that of the method of handling the various groups of drugs. Certain groups, for example, the salts of the heavy metals, can easily be presented from a chemical characteristic. Even with this rather simple group, if a chemical consideration be largely the sole consideration, the student fails to realize their value as agents in terminating certain important infections. Their specific toxic action may be used to emphasize the value of understanding their chemical structure and the effect of structural changes in lessening their affinity cells of the host and increasing their specific toxicity for certain invading cells. Certain of the general anesthetic bodies and the group of substances usually classed as hypnotics on account of their similarity in chemical structures may be studied from this point of view. But once they are introduced into tissues, even tissues of the central nervous

system, the value of this classification breaks down because it fails to explain their selective action upon different parts of this system, their toxicity for such tissues as blood and their affinity for organs other than the brain and spinal cord. Certain of the drugs may be grouped and studied on the basis of their remarkable selective affinity for certain groups of cells such as those found in ganglia or for their ability to stimulate or depress various types of sympathetic endings. Such a grouping is of great physicological value and it simplifies the teaching of the pharmacology of the group. It excludes many other important actions and focuses the student's attention upon the effect of these substances on certain isolated structures, and he often fails to grasp the action of the group in its entirety. We are unable to present the pharmacology of such groups as the circulatory stimulants on a chemical basis or on the basis of the isolated anatomical structures which they influence. Their action on a variety of tissues has to be understood for the entire effect of the substance to be appreciated. I cannot help but feel that the most useful grouping of drugs from the standpoint of the medical student is on the basis of their dominant action on certain systems or groups of organs, giving adequate attention to special actions which members of the group may have on particular organs, on metabolism and during elimination. I have the feeling that the laboratory work in pharmacology may be made of particular interest to the medical student and that it furnishes the opportunity to start in him a method of approach to study the reactions of living material to drugs which he should carry into his clinical years and at the bedside so long as he remains interested in the science and art of medicine. Laboratory work may be of value, it may be of value, it may be worthless and it may do actual harm. In the laboratory which I am thinking about, the student must of necessity have a guide to commence not intricate, but some simple experiments. The guide serves to give him a start and to raise not one but many questions. He introduces something; in this laboratory it is perhaps a drug of known quantity and standard potency into a living, highly complex organism; and then he attempts to explain by observation, references, the aid of his instructors what happened and how it happened. It is of equal importance that he try to understand why this reaction which he anticipated with such certainty failed to happen. Regardless of what system has been employed in teaching pharmacology, we may assume that the student has learned what drugs may be expected to do or not to do when they are introduced into living tissue. We wind up our course with a drug and living tissue. Is it sound pedagogy for the work in pharmacology to terminate here? Why has the medical student obtained this information? Has he mastered this division of medical understanding for the sole purpose of the mental training which it imparts and for its biological significance, or has he in addition to this acquired it in order that he may apply it in the modification of symptoms which are harmful, and in the actual cure of disease? I have the belief that he looks forward to using these substances as therapeutic agents. If this be the case, then every department of pharmacology should be so constructed that one member of its teaching force carries action of the drug a step further and investigates its effects upon pathological animals and at the bedside. If this is done they will have acquired an understanding of the action of drugs and allied agents not only in normal but in pathological tissues.—W. DeB. MacNider, *Southern M. J.*, March, 1932.

Teaching of Medical History

The encouragement of interest in and knowledge of medical history is not primarily the task of the historian but that of the physiologist, the biochemist, the anatomist, the pathologist and the clinical teacher. The bedside, the dispensary and the laboratory, these seem to me to be places to talk about the history of medicine and to exemplify the historical method of thinking and learning about disease. In the teaching of medicine, opportunities for this use of historical material occur as often as one wishes, and its introduction is natural and easy. On ward rounds with students we discuss the diet of a patient with typhoid fever. The make-up and amount of this diet are influenced by the doctrines of Hippocrates, by the courage of Graves, by the reasoning and common sense of Austin Flint and Shattuck, and the careful studies of Coleman. Or one exhibits in a clinic a patient with Addisonian anemia. How better to draw a picture of this condition than by tracing the growth of our knowledge of it through the work of Addison, Biermer, Hayem, von Mering, Ehrlich, Lichtheim, William Hunter and Arthur Hurst, to that of Minot and Murphy and Sturgis and Castle.—C. S. BURWELL, *Southern M. J.*, April, 1932.

Teaching of Medical History

Every student ought to obtain at some time during his four year course in a medical school, an insight into the history of his profession. With an already overcrowded curriculum it does not seem advisable to add a definite course in medical history, and most medical schools have arranged for this teaching, therefore, through the inauguration of voluntary exercises. These exercises are often given by one of the professors as a series of seminars, a method of teaching which probably reached its height, many years ago, under the leadership of the late Sir William Osler at the Johns Hopkins Hospital. Dr. C. N. B. Camac, assistant professor of clinical medicine in the College of Physicians and Surgeons, Columbia University, New York, has written an account of his methods of teaching medical history. He gives his students a general background of medical history, and points out to them certain trends illustrated by the important books related to the subject. At his seminar these books are usually exhibited and quotations are often read from them. The conferences are informal, limited to ten or fifteen students, and no lectures are ever given. About an hour is devoted to the preliminary exercises, after which time the students remain for from half to three-quarters of an hour examining the books. Dr. Camac has found it convenient to use the College Library.—EDITORIAL, *New England J. M.*, March 31, 1932.

Instruction in Psychiatry

The required courses in psychiatry in Yale medical school are fundamental in this program of teaching. In the second year of medical training a series of introductory lectures, covering the basic principles of psychiatry, is given during the third trimester. The third-year medical school class has a series of both lectures and clinics for one trimester. Having completed these two courses the third and fourth-year medical students attend psychiatric clinics once a week through one trimester. These three courses are required subjects, but in addition several elective courses are open to students who wish further training. For the most part these elective courses offer opportunity for clinical observations in both the psychiatric clinic and psychiatric dispensary.—E. KAHN, Methods and Problems of Medical Education. Rockefeller Foundation, 1932.

Book Reviews

Handbook of Skin Diseases

By Frederick Gardiner, M. D., Lecturer on Skin Diseases in the University of Edinburgh. 3rd edition. William Wood and Company, New York. 1931. Price, $3.50.

The commoner skin diseases only are discussed. Treatment is stressed. Many excellent illustrations add to the value of the text. A good book, of small size, for the undergraduate medical student.

Aids to Surgical Anatomy

By Richard H. Hunter, M. D., M. Ch., Ph. D., Lecturer in Anatomy, Queen's University, Belfast. William Wood and Company, New York. 1931. Price, $1.50.

Aids to Medical Treatment

By J. T. Lewis, M. D., B. Sc., M. R. C. P., Lond., and T. H. Crozier, M. D., D. P. H., M. R. C. P., Lond., Physicians Belfast Infirmary. William Wood and Company, New York. 1931. Price, $1.50.

Two excellent little books which every medical student will find useful both for study and review. Essentials only are presented and, although concise, are nevertheless complete.

Fractures of the Jaws

By Robert H. Ivy, M. D., D. D. S., F. A. C. S., Professor of Maxillo-Facial Surgery, and Lawrence Curtis, A. B., M. D., D. D. S., Assistant Professor of Maxillo-Facial Surgery, Graduate School of Medicine, and School of Dentistry, University of Pennsylvania. Lea & Febiger, Philadelphia. 1931. Price, $4.50.

This book covers the treatment of fractures of the jaws and their complications. The methods presented are based on many years of successful experience by two recognized experts and are those which they have found to be most successful.

These methods can be employed immediately by the surgeon, the oral surgery specialist or the dentist, regardless of the case and without resort to highly technical dental laboratory procedures which lose precious time in the reduction and fixation of the fractures.

The many illustrations in this book are, for the most part, original. They clarify the text and simplify the procedure of applying the methods.

Neuro-anatomy: A Laboratory Guide

By J. H. Globus, M. D., Associate Professor of Neuroanatomy and Neuropathology, New York University and Bellevue Hospital Medical College. 5th edition. Paul B. Hoeber, Inc., New York. 1931. Price, $3.50.

A collection of drawings, outlines, diagrams and photomicrographs intended to spare the student much unprofitable labor and to give him opportunity for independence and precision in the interpretation of his observations. The drawings are prepared from carefully dissected anatomical specimens. The task of labeling the various structures is left to the student. This edition is fully revised and amplified to meet the needs of present methods of instruction in the anatomy of the central nervous system of man and is adapted to the human brain as teaching material. A new feature is a list of topics which the student is asked to utilize in the preparation of brief summaries or reviews of problems discussed or investigated in the daily progress of the course.

Resistance to Infectious Diseases

By Hans Zinsser, M. D., Professor of Bacteriology and Immunity in Harvard University Medical School. 4th edition. The Macmillan Company, New York. Price, $7.

Eight years have elapsed since the publication of the previous edition. Additions, deletions and rewriting bring the book in consonance with present day knowledge and theories in this field. A separate chapter is given to a discussion of antigens, and one to antibodies and the general principles underlying antigen-antibody reactions. Technical details of diagnostic reactions and experimental methods are eliminated almost completely. The chapters dealing with hypersensitiveness have been almost completely rewritten. The section dealing with immunity in the ultramicroscopic virus diseases is brought fully up-to-date. The chapters dealing with the application of immunological theory and practice to the diagnosis and therapy of infectious disease have been changed and enlarged. In fact, each chapter from the first onward leads up to these chapters dealing with the practical problems of disease. The author and his work are too well known and appreciated to call for any endorsement of this book. It is a most valuable addition to every library.

Approved Laboratory Technic

Prepared under the Auspices of the American Society of Clinical Pathologists by John A. Kolmer and Fred Boerner of the Graduate School of Medicine of the University of Pennsylvania, assisted by C. Zent Garber of the Peking Union Medical College and a Committee from the Society. Price, $10.

The fact that this book has the approval of the American Society of Clinical Pathologists and was prepared under its direction suffices to ensure its worth. Clinical pathology is such a comprehensive and important part of clinical medicine or medical practice that it is essential for the student, as well as the practitioner, to have available for constant use or reference reliable information not only on how to perform certain procedures but an explanation of the significance of their results and findings. This book supplies all of these needs. It makes possible the wider application of clinical laboratory methods to the diagnosis of disease. No student can afford not to have a copy of this book.

Modern Medical Treatment

By E. Bellingham-Smith, M. D., and Anthony Feiling, M. D., Lecturers on Medicine, St. George's Hospital. Two volumes. William Wood and Company, New York. 1931. Price, $12 the set.

Any work devoted to the treatment of diseases should be welcomed with open arms. The many refinements and complexities of modern diagnostic methods have tended to lessen interest in the art and science of therapeutics. This subject is presented here from the aspect of the disease concerned and not from that of the remedies employed. Brief summaries of etiology, symptoms and complications are presented. Prognosis is discussed in so far as it affects treatment. Only accepted methods of treatment are presented—based on personal experience alone. It is essentially a book for the medical student and the general practitioner. Volume I. discusses diseases of the nervous system, heart, blood vessels, blood, spleen, lymph nodes, endocrine glands, respiratory system, kidney and urinary tract. Volume II. discusses diseases of the alimentary canal, liver, joints and muscles, infectious diseases, disorders of metabolism and intoxications.